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STEEL

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PRODUCTION · PROCESSING · DISTRIBUTION · USE

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LET MORGAN WORCESTER ENGINEERS AND MANUFACTURERS *REMOVE THE LAGS*

As the Editor Views the News

■ STEEL production last week (p. 21) moved up 3½ points to 60 per cent of ingot capacity, the highest level in nearly eight months. Indications point to maintenance or furtherance (p. 59) of recent gains in finished steel demand. July bookings of some leading products were 20 to 25 per cent ahead of the June tonnage. Buyers show less tendency to restrict orders to immediate needs. Part of the current improvement is due to anticipation of heavier requirements of the automotive industry in the near future. Diversification of orders is noteworthy. New quantity extras on hot-rolled carbon bars result in higher prices on lots less than 20 tons. Plain bars no longer are being sold as reinforcing material. . . . Thirteen leading steel producers (p. 17) had aggregate net earnings of over $21,000,000 in the first half.

• • •

Exports May Increase

United States' abrogation of the 1911 trade treaty with Japan is viewed (p. 15) as a political bargaining rather than economic move, to clear the decks for guarantees for American rights in China and modification of certain Japanese policies. In the meantime, exports to Japan may be accelerated over the next few months. . . . Our aeronautical exports in the first five months of this year (p. 27) reached a new record; however, Germany and Italy outsold us in 18 countries, including six in Latin America. . . . A. H. Allen, STEEL's Detroit editor, sees the automobile industry unions as under the necessity of continually stirring up trouble (p. 29) in order to retain their dues paying membership. Some sort of showdown will be necessary before satisfactory industrial relations become possible.

• • •

Recovery Up To Business

Reduced taxes, less government spending and less interference with business are widely considered prime requisites for recovery, according to a nationwide survey (p. 25) by the National Association of Manufacturers. The survey reveals the public believes business must be the motivating force toward recovery. . . . Republic Steel Corp. has leased the Chateaugay iron ore mine in northern New York (p. 21) for a period of 25 years. . . . Under a new law signed last week (p. 25) competitive bidding on federal contracts for aircraft parts may be abandoned. The spend-lend program was favorably reported last week by the banking and currency committee of the senate. . . . W. E. Whipp (p. 9) declares the machine does not need defense; emphasis should be on its benefits to our modern standard of living.

• • •

Equipment Cuts Costs

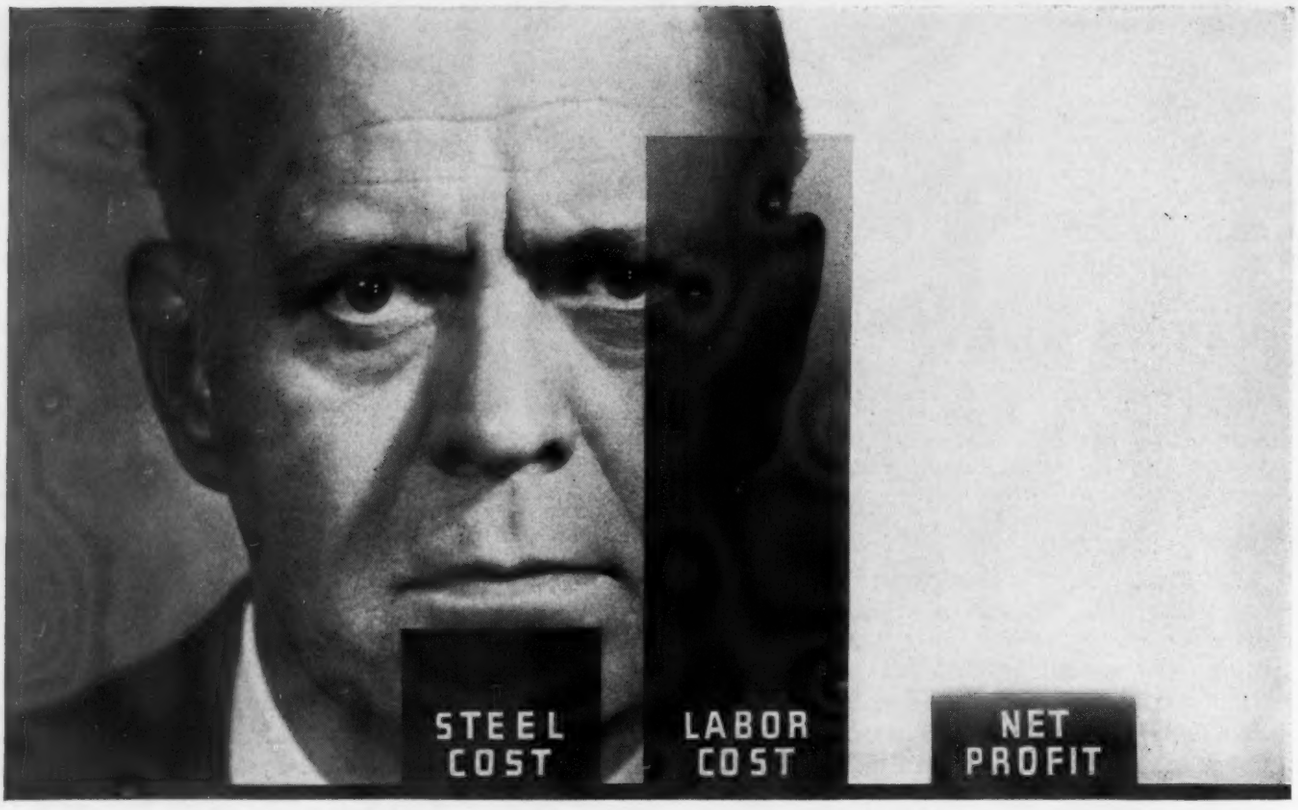
"Hole engineering" has become an important factor in production technique, according to Guy Hubbard, STEEL's machine tool editor. Without the existing multiple spindle machines for drilling, boring, reaming, tapping and related operations, the cost of the average car in the medium price field today (p. 36) would be at least $100 more than it is. . . . Worn surfaces of machine parts increasingly are being restored (p. 38) by spraying them with high carbon, straight chromium rustless steels; the technique has been thoroughly developed. . . . New equipment has reduced the cost of handling at an eastern coal yard. Primary unit (p. 40) is a light and relatively inexpensive traveling bridge with a rope-operated man trolley; an auxiliary boom almost doubles the effective span.

• • •

Improving Efficiency

Use of clay spheres in the stoves permits increasing blast temperature from 1100 to 1500 degrees Fahr. This is one of the features of a modernization program by which (p. 48) the efficiency of a small blast furnace has been improved. . . . Development of hard-surfaced disks and seats (p. 42) permits production of valves that have long life under severe service conditions involving high temperatures and pressures. . . . Much new information about the commercial application of thin silver coatings now is available, according to the ninth progress report (p. 51) on the second research campaign of the American silver producers. . . . Few structural fabricating shops, says an authority, are equipped (p. 52) to provide adequate surface protection. . . . Commercial forging ingots (p. 55) now weigh up 500,000 pounds.

E C Kreutzberg



Consider Labor Costs When Buying Steel

On most jobs, shop labor costs are the biggest single factor—and they depend to a large degree on the steel used. If bars are too hard for bending or forming—or have hard spots to break or dull tools—if some shapes are not straight—or if in the case of alloy steel the required properties are not developed by the first heat treatment—then up go costs, down go profits.

Purchasing steel that is uniform and has the properties most desirable for your particular use often pays big dividends in the form of decreased shop costs. You do not have to pay any more for this kind of steel—so why not get it?

For several years Ryerson has been building up stocks of these better, more uniform steels. Careful selection, checking, testing and inspecting assure the uniform high quality necessary for Ryerson Certification. Try Ryerson Certified Steels on your hardest job—and check the labor costs. Many have told us that it pays.

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"Tightening the Bit"—Industry's View of Japanese Treaty Abrogation

■ UNITED STATES' abrogation of the 1911 trade treaty with Japan last week is viewed by industry as a political bargaining rather than economic move. Although heralded as opening the way for possible embargo against exports to Japan, at the end of six months, informed observers believe that this is unlikely. Rather they interpret the administration's action as clearing the decks for negotiations for guarantees for American rights in China and modification of certain Japanese policies.

Nevertheless, the move placed this country's million-dollar-a-day trade with the Nipponese under a cloud. Introduced and much discussed during the current session of congress has been the Pittman resolution for an embargo against exports to Japan. Backed by the senate foreign relations committee, this resolution in amended form would provide an embargo on munitions and implements of war and on "iron, steel, oil, gasoline, scrap iron, scrap steel and scrap metals containing a combination of iron or steel or other metals or any combination of metals."

What action may be taken on this question after next January will, of course, depend largely on events of the next six months.

In New York some leading metals exporters told STEEL's editors they believed the ultimate net effect of the treaty denunciation may be merely a "tightening of the bit" in American-Japanese relations, with Japan modifying her recent policies in China and the United States acting with reasonable deference to Japan's position as an old and important customer.

What is the iron, steel and metals stake in trade with Japan?

Japan has been buying well over 1,000,000 gross tons of iron and steel scrap annually for the past five years, reaching 1,865,000 tons in 1937. Before last November the country was a good market for other steel products. At that time, however, she announced a closed door against finished steel products from other nations, indicating sufficient steelmaking capacity to produce her own requirements. She continued, however, to depend on outside supplies of raw materials, obtaining iron ore from many sources on Pacific shores and scrap from this country. Her iron, steel and scrap imports from the United States:

(Gross Tons)

	Iron and steel products	Iron and steel scrap	Total
1939, 5 mos...	72,306	860,975	933,101
1938	484,879	1,156,768	1,641,647
1937	879,652	1,865,918	2,745,570
1936	54,101	1,009,767	1,063,808
1935	83,416	1,065,143	1,148,559
1934	80,746	1,168,498	1,249,246

American machine tools also have found an important market in the Far East. Japan doubled machine tool imports in 1938 over 1937 (STEEL, May 1, p. 32), increasing total imports from approximately $17,000,000 to $35,000,000. She bought $12,151,886 worth from the United States in 1937 and $23,811,408 worth in 1938. This represented 69.6 and 67 per cent, respectively, of her total purchases from all countries. Machine tool shipments this year have averaged more than $2,000,000 per month, promising a higher total than in 1938.

Institute of Pacific Relations reports Japanese imports of metalworking equipment increased from $30,000,000 in 1936 to $53,000,000 in 1937, with the United States furnishing $30,000,000 in the latter year.

The country's campaign toward greater self-sufficiency in iron and steel also has brought to American engineering firms some sizable orders for steel mill equipment. With-

◆

Loading Scrap For Japan

■ West Coast ports are busy loading iron and steel scrap for Japan. Leading foreign outlet for American scrap in recent years, Japan has taken 860,975 tons during the first five months of 1939. NEA photo

in the past month it was announced several million dollars worth of such equipment had been ordered from United Engineering & Foundry Co. for two Japanese steelworks. This included an 86-inch semicontinuous plate mill, and a sheet mill. United announced in April it was shipping equipment from its machine shop at Wooster, O., to Japan where it proposed to operate it as a branch.

In 1938 Japan was the leading foreign buyer of American aeronautical equipment. Amounting to but $989,100 in 1936 and $2,500,000 in 1937, her purchases rose last year to a record peak of $11,000,000. Since beginning of this year, however, Japan has been replaced by France, Great Britain and the Netherlands as our best export markets for aircraft.

Other principal exports from the United States to Japan include cotton, petroleum and copper.

Should it appear as time goes on that embargo is probable, Japanese buying in the United States, particularly of scrap and necessary machinery, is likely to be accelerated. A shrewd trader, Japan, however, probably would proceed cautiously so as to avoid, if possible, having to pay too sharply increased prices.

SEE HIGHER FOREIGN DEMAND FOR AMERICAN STEEL

NEW YORK

Increasing foreign demand for iron and steel products may swell the already expanding volume of business for American mills.

That foreign buying will provide substantial business for domestic mills over the next few months is indicated by actual inquiries now pending, rumors of large tonnages likely to come on the market, stronger prices and increasing activity among European mills.

Associated with these developments is the report a move is underway to induce several independent American steel companies to join the American Steel Export association, organized under the Webb-Pomerene law to engage cooperatively in the world market for steel with the international steel cartel. So far, the independents have shown little inclination to market steel within the cartel in view of the small quotas offered. Most of these companies engage primarily in production of steel plates and have been doing a substantial volume of business with Holland and Scandinavian countries.

Among large inquiries rumored currently is one involving several hundred thousand tons of ingots and slabs, in armor plate specifications, for Japan. Another report is England may buy 300,000 tons of armor plate or semifinished. France is understood to be sizing up the market with the view of possibly placing tonnage. Inquiries are in the market for lots of several hundred tons for Holland and Turkey.

Other than armor plate, most steel recently purchased or on inquiry can be traced only indirectly to rearmament. In fact, American steel mills are likely to benefit more from tonnage diverted from European mills busy on armaments and unable to supply their customers in Latin America, the Far East and other sections.

British mills now are operating near capacity. German mills likewise are well occupied. Mills in France still are able to supply some foreign demand but are becoming busier. Situation in Belgium and Luxemburg is less acute but mills there are not well equipped to satisfy diversified requirements.

Much of the slack in excess steelmaking capacity has been taken up in the past few months and a general tightening of the entire situation is not improbable.

Great Britain is becoming a leading customer of the United States. That country has just placed orders for 10,000 to 12,000 tons of hot-rolled strip in coils for rerolling on cold mill equipment. June statistics, just revealed, show that Britain took 2000 tons of hot strip that month, 1800 tons in May. Hot-rolled sheet shipments in the past two months averaged 3000 tons. An inquiry for 100,000 tons of galvanized sheets for air-raid shelters is alive but may not be placed.

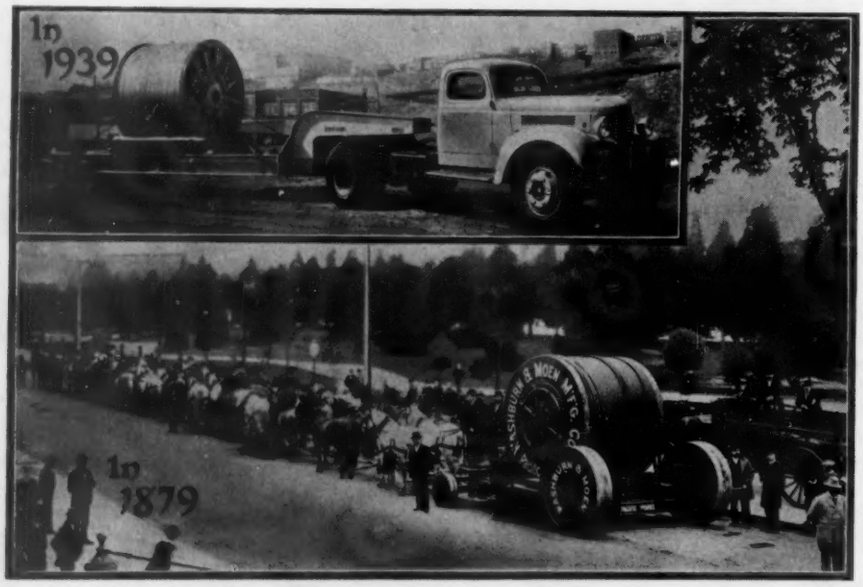
Ship Plate Exports Gaining

Significant was the purchase a few days ago of 4500 tons of ship plates by Denmark, first of any importance recently. This purchase will appear in the August statistics, it is indicated. June exports of non-alloy plates, mostly for ship work, totaled 28,000 tons, with Sweden accounting for about 8500, Holland for 5500, Mozambique for 3000 and Norway for 1100. Round lots also were taken by many other countries, including Finland, South Africa, China, Italy, Brazil and India. Prices are firmer.

Partly traceable to war activity is 3000 tons of high-speed wire rods, for which Japan is reported inquiring. Bulgaria also is in the market for 8000 to 10,000 tons of No. 5 wire rods. Greece has been participating frequently in the wire rod market. Most American makers of plain wire are reported out of the market inasmuch as prices are about one-third too high.

Surprisingly enough, China has been a factor recently in American export trade despite loss of a large part of her territory. Nearly 4000 tons of pig iron have been shipped in the last few weeks, partly from Eastern Pennsylvania plants but mostly from southern furnaces. China also is interested in high-grade scrap, apparently for reworking, and has taken round lots of wire rods, the June total being about 2300 tons. China also took some 1200 tons of carbon bars in June, and it is understood that 3600 tons shipped to French Indo-China eventually reached China's newly industrialized interior.

Fifty Years in Handling Progress



■ **Fifty years have witnessed great change in handling reels of steel bridge cable. Once it required 50 draft horses, preceded and flanked by outriders, to haul heavy cable. Today, as shown in inset, the same load is moved by a 3-ton Dodge truck and Fruehauf welded steel trailer**

Steel's First Half Net Profit 0.6 of 1

Per Cent on Investment

■ THIRTEEN leading steel producers, representing 85.3 per cent of the country's total ingot capacity, reported aggregate net earnings of $21,109,152 for the first six months this year. Although meager, first half income compares favorably with the record for the comparable period last year when the identical companies' net loss was $12,426,876.

Second quarter earnings, $12,199,409, were nearly 24 per cent above those for the first three months, despite a lower operating rate for the June period. First quarter operations, resulting in $9,852,417 net profit, averaged 54.64 per cent of ingot capacity. Second quarter operations averaged 50.86 per cent.

For some companies second quarter improvement in earnings apparently was due to other than steelmaking activities.

Assuming the experiences of the 13 producers already reported to be typical, the industry's indicated net earnings for the first half would approximate $24,700,000. This is less than 0.6 of 1 per cent for six months, or at an annual rate of 1.16 per cent, on the industry's investment, $4,155,017,000 at end of 1938.

These figures indicate this year's first half earnings were slightly better than for the comparable period in 1935, but far below those for 1936 and 1937. Comparable figures for the six previous years: 1933, $60,000,000 loss; 1934, $18,500,000 profit; 1935, $20,800,000 profit; 1936, $49,700,000 profit; 1937, $158,100,000 profit; 1938, $16,000,000 loss.

Indicated profit per ton of ingots produced in the first half was $1.32. Indicated profit per ton of capacity was 69 cents.

EARNINGS UP, BETHLEHEM RESUMES COMMON DIVIDENDS

Bethlehem Steel Corp. last week resumed dividends on common stock with a payment of 50 cents per share.

Dividend is payable Sept. 15 to record Aug. 25. Last payment was $2.50, on Dec. 24, 1937.

Corporation's net earnings improved during the second quarter, amounting to $3,822,927, equivalent to 61 cents per common share, after allowing for regular quarterly distributions on two classes of preferred stock and all other deductions. This compares with net profit in the first three months of $2,409,059, or 17 cents a common share.

For the first half this year indicated net earnings total $6,231,986, as against $1,145,213 in the corresponding period of 1938.

Elaborating on the firm's report, Eugene G. Grace, president, said operations currently are at 61 per cent of capacity.

Value of orders on hand June 30 was estimated at $184,921,081, against $192,040,906 on March 31, and $89,916,012 June 30, 1938. The $7,000,000 reduction in backlog during the past quarter was attributed to progress made on shipbuilding work.

Outlining the price situation, Mr. Grace explained that billing prices have not varied so much as 50 cents per ton on a weighted average since the last quarter of 1938. However, prices in the past quarter were more than $5 a ton less than in the corresponding period last year. Although the price structure is stiffening, he asserted, automobile builders in many instances are protected on their steel requirements up to the end of this year at the low prices prevailing during the period of sharp concessions on sheet and strip last May. Other consumers have the same protection to Sept. 30.

Bethlehem "made some money with operations above 60 per cent

Steel Producers' Financial Statements Summarized

	Second Quarter 1939	First Quarter 1939	Second Quarter 1938	First Half 1939	First Half 1938	Ingot capacity, gross tons
United States Steel Corp.	$1,309,761	$660,551	$5,010,426*	$1,970,311	$6,302,577*	25,790,000
Bethlehem Steel Corp.	3,822,927	2,409,059	150,305	6,231,986	1,145,213	10,042,000
Republic Steel Corp.	550,412	532,899	2,856,317*	1,083,311	5,918,881*	6,500,000
Jones & Laughlin Steel Corp.	471,287	376,525*	1,654,303*	847,812*	2,924,028*	3,660,000
National Steel Corp.	1,958,755	2,426,669	1,005,863	4,385,424	2,094,498	3,400,000
Youngstown Sheet & Tube Co.	329,086	217,107	118,033	546,193	21,496*	3,120,000
Inland Steel Co.	1,760,459	2,024,601	1,135,097	3,785,060	2,058,173	2,760,000
American Rolling Mill Co.	875,671	793,479	525,854*	1,669,150	723,165*	2,669,520
Wheeling Steel Corp.	939,995	828,661	624,888*	1,768,656	1,155,923*	1,750,000
Sharon Steel Corp.	148,157*	7,613	192,006*	140,544*	343,915*	500,000
Continental Steel Corp.	253,128	279,178	156,091	532,307	211,300	325,000
Wickwire Spencer Steel Co.	149,100*	158,753*	117,922*	307,853*	449,838*	150,000
Rustless Iron & Steel Corp.	225,185	207,778	33,686*	432,963	96,337*	†35,000
Totals	$12,199,409	$9,852,417	$9,450,013*	$21,109,152	$12,426,876*	60,701,520
FINISHING CAPACITY ONLY						
Superior Steel Corp.	$54,043*	$6,773*	$121,290*	$60,776*	$262,457*	.....
Acme Steel Co.	259,969	339,671	62,170	559,641	63,139	.....
PIG IRON CAPACITY ONLY						
Interlake Iron Corp.	$442,574*	$350,678*	$294,587*	$793,252*	$266,321*	1,215,000
Virginia Iron, Coal & Coke Co.	53,615*	36,811*	66,885*	90,427*	94,949*	200,000

*Loss. †Stainless steel ingots.

of capacity, but not enough for an adequate return on capital invested." Mr. Grace contended this was due to lack of a reasonable spread between costs and selling prices.

Company's labor relations were never better, he said. In the second quarter 88,447 employes averaged 43.2 hours weekly, earned a total of $35,677,000. During the same period last year 80,387 workers averaged 28.2 hours a week, with $27,000,000 payroll.

In the first six months firm expended $5,000,000 for new construction, plans to spend another $7,000,000 during remainder of the year. New facilities scheduled for its Sparrows Point, Md., plant will add 8000 to 10,000 tons to monthly capacity. Included: Equipment for continuous rolling of small pipe; cold rolled tin plate facilities; and unit for making Bethanized wire.

U. S. STEEL HAS LARGER PROFIT IN SECOND QUARTER

United States Steel Corp.'s net profit in the second quarter was $1,309,761, almost double the $660,551 reported in first three months. June quarter last year resulted in a deficit of $5,010,426.

Net income for first six months totaled $1,970,311, against a deficit of $6,302,577 in comparable 1938 period.

Directors declared regular quarterly preferred dividend of $1.75 a share, payable Aug. 19; no action was taken on common.

Corporation's improved second quarter earnings, in the face of lower finished steel shipments, were due mainly to seasonal factors. Probably contributing were better cement business, improved ship work, more active ore operations and better return from transportation operations.

Commenting on the report, E. R. Stettinius Jr., chairman, declared finished steel shipments in the June quarter were about 3½ per cent less than in preceding period. In the first half finished steel shipments averaged 49.2 per cent of capacity, against 33.6 per cent in the comparable 1938 period.

Net current assets of the corporation and subsidiaries, before deducting current divided declarations, totaled $410,186,626 on June 30, compared with $426,924,776 at the close of the previous quarter and $426,984,023 on Dec. 31, 1938. The above net amounts are calculated on the basis of including in current liabilities, capital obligations due within one year and excluding from current assets the receivables not collectible within one year.

Capital outlays for additions and improvements in the first half approximated $4,700,000. About $3,400,000 capital obligations maturing or retirable by sinking funds were paid, making a total net outlay on capital account last quarter of $8,100,000. On July 1 the unexpended balance of approved appropriations was about $20,000,000.

Number of employes for the first half was 208,113, an increase of 0.85 per cent from the 206,357 during the first half of 1938. Total payrolls increased 20.85 per cent from $135,252,626 in the first half of 1938. to $163,461,751 in the comparable 1939 period.

There are at present 213,728 employes, many of whom, however, are working on part time. Part-time employment extends to salaried employes as well as wage earners.

INLAND'S PROFIT LOWER THAN FIRST QUARTER

Inland Steel Co., Chicago, had second quarter net profit of $1,760,459, equal to $1.08 per share on capital stock. This is slightly lower than the $2,024,601 net profit reported in the March quarter, but exceeds the $1,135,097 earned in the June, 1938, period.

Six months' net profit totaled $3,785,060, or $2.33 a share, against $2,058,173, equal to $1.30 a share in the first half last year.

Directors declared a cash dividend of 50 cents per share on capital stock, payable Sept. 1 to record Aug. 15.

YOUNGSTOWN SHEET & TUBE

Youngstown Sheet & Tube Co., Youngstown, O., had a net profit of $329,086 in the June quarter, compared with net of $217,107 in preceding period and $118,033 in the June, 1938, quarter.

For the six months net profit totaled $546,193, equal to eight cents

Consumers' First Half Net Profit Up Sharply

■ Total first half net income of 74 steel consumers and suppliers aggregated $50,109,597, an increase of 115.6 per cent over the $23,243,746 total income reported in the comparable 1938 period. STEEL's tabulation, July 24, page 20, included 35 companies, while the following table lists 39. Only 14 of the 74 companies recorded a loss in the first half this year, while a year ago 36 companies had a deficit. All figures are net income, except where asterisk denotes loss.

	Second Quarter 1939	Second Quarter 1938	First Half 1939	First Half 1938
Aetna Ball Bearing Mfg. Co., Chicago	$49,630	$10,974	$113,182	$10,045
Allis-Chalmers Mfg. Co., Milwaukee	990,145	1,475,410	1,700,422	2,879,059
American Radiator & Standard Sanitary Corp., New York	814,071	151,103*	940,650	800,700*
American Stamping Co., Cleveland	.....	.....	41,617	10,697*
Atlas Tack Corp., Fairhaven, Mass.	.....	.....	46,384	3,027*
Bendix Aviation Corp., South Bend, Ind.	1,144,214	65,641	2,168,210	495,999*
Birdsboro Steel Fdry. & Mach. Co., Birdsboro, Pa.	.....	.....	8,570*	146,259*
Bliss & Laughlin Inc., Harvey, Ill.	119,134	10,875*	253,515	36,966*
Bryan Jackson Co., Berkeley, Calif.	100,156	191,198	219,227	419,163
Bucyrus-Erie Co., Milwaukee	....	.	679,487	362,883
Budd Wheel Co., Philadelphia	140,768	169,264*	276,274	365,225*
Campbell, Wyant & Cannon Fdry Co., Muskegon, Mich.	40,218*	88,295*	38,968*	168,471*
Chicago Railway Equipment Co., Chicago	23,224	8,527	12,389	57,157*
Clark Equipment Co., Buchanan, Mich.	256,400	125,048	500,191	151,258
Continental Roll & Steel Fdry. Co., East Chicago, Ind.	.....	.....	106,586*	39,041*
Doehler Die Casting Co., Toledo, O.	123,543	29,553	263,128	109,729
Edward G. Budd Mfg. Co., Philadelphia	173,544	773,290*	274,933	1,030,202*
Eisler Electric Corp., Union City, N. J.	.....	.....	14,715	30,094*
Electromaster Inc., Detroit	459	29,852*	63,155*	21,368*
Ex-Cell-O Corp., Detroit	187,057	26,186	336,828	158,249
Gabriel Co., Cleveland	14,188	3,565*	7,466	19,844*
General Railway Signal Co., Rochester, N. Y.	35,579	110,998*	36,288*	110,290*
General Refractories Co., Philadelphia	71,738	37,933*	133,686	66,673
Harbison-Walker Refractories Co., Pittsburgh	191,200	87,100	398,700	229,600
Lamson & Sessions Co., Cleveland	.....	.....	99,574*	242,676*
M. A. Hanna Co., Cleveland	315,105	163,038	487,211	220,600
Minneapolis-Honeywell Regulator Co., Minneapolis	287,777	160,317	355,066	142,907
Packard Motor Car Co., Detroit	1,270,945*	855,535*	1,040,616*	1,244,965*
Pittsburgh Screw & Bolt Corp., Pittsburgh	41,350*	125,759*	49,476*	227,014*
Pressed Steel Car Co., Pittsburgh	177,564*	36,691*	415,470*	692,772*
Seagrave Corp., Columbus, O.	7,029	12,548*	33,434*	6,942*
Superheater Co., New York	84,507	256,162	266,559	330,613
Thew Shovel Co., Lorain, O.	.....	.....	340,747	93,369
Transue & Williams Steel Forging Corp., Alliance, O.	9,367*	61,917*	524*	130,136*
United Aircraft Corp., East Hartford, Conn.	2,187,890	1,349,413	3,678,689	2,421,711
U. S. Hoffman Machinery Corp., New York	87,459	111,700*	89,900	127,625*
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.	3,982,635	2,469,372	6,338,785	4,500,602
Worthington Pump & Mach. Corp., Harrison, N. J.	119,326	.....	95,164*	331,337
Youngstown Steel Door Co., Youngstown	.....	.....	193,363	7,057

a common share, against a net loss of $21,496 in the same 1938 period.

AMERICAN ROLLING MILL

American Rolling Mill Co., Middletown, O., reports slight improvement in second quarter net profit to $875,671. This compares with net of $793,479 in the preceding period and deficit of $525,854 in the June, 1938, quarter. First half net profit totaled $1,669,150, equal to 23 cents a common share, but includes receipt of nonrecurring income of approximately $400,000 during the March quarter. In the first half last year, net loss of $723,164 was reported.

In commenting on the report, Calvin Verity, executive vice president, declared, "We anticipate an increased volume of business during the second half. However, the lower prices for sheets now prevailing throughout the industry will undoubtedly offset much of the advantage of increased volume."

WHEELING STEEL

Wheeling Steel Corp., Wheeling, W. Va., had second quarter net profit of $939,995, equal to 81 cents a common share, compared with $828,661, or 61 cents a share in the March quarter. In the June, 1938, period net loss was $624,888.

For the first half net profit totaled $1,768,656, equal to $1.43 a share, against deficit of $1,155,923 in the corresponding 1938 period.

JONES & LAUGHLIN

Jones & Lauglin Steel Corp., Pittsburgh, reports second quarter net loss of $471,287, a somewhat larger deficit than the $376,525 recorded in the first three months. In the June period last year net loss totaled $1,654,303.

For the six months ended June 30 net loss aggregated $847,812, against a deficit of $2,924,028 in comparable 1938 period.

CONTINENTAL STEEL

Continental Steel Corp., Kokomo, Ind., had net profit of $253,128, equal to $1.06 a common share, in the second quarter. This compares with a net of $279,178, or $1.18 a share for the preceding period and $156,091, or 57 cents a share in the June, 1938, quarter.

In the first half net profit totaled $532,307, equivalent to $2.24 a common share, compared with $211,300, or 63 cents a share in the comparable 1938 period.

PITTSBURGH STEEL

Pittsburgh Steel Co., Pittsburgh, had net loss of $232,615 in the second quarter, against a deficit of $377,159 in the preceding period. Total deficit in the first six months amounted to $609,774. No comparable figures are available for the second quarter or first half of 1938 and because of this the company is not included in the producers table on page 17.

NATIONAL STEEL

National Steel Corp., Pittsburgh, reports $1,958,755 net profit in the second quarter, against net of $2,426,669 in preceding period and $1,005,863 in corresponding 1938 quarter.

First half net profit totaled $4,385,424, equal to $1.99 a share, compared with net of $2,094,499, or 96 cents a share in first half of 1938.

OTIS STEEL

Otis Steel Co., Cleveland, had second quarter net loss of $431,766, against a profit of $180,325 in the initial period. In the June quarter last year a deficit of $520,101 was reported.

First half net loss totaled $251,441, compared with a deficit of $817,480 in the comparable 1938 period. Otis' report was received too late to be included among the producers listed in table on page 17.

CRUCIBLE STEEL

Crucible Steel Co. of America, New York, reports net profit of $350,821, or $1.47 a share on 7 per cent preferred, in the first half. This compares with net loss of $540,360 in comparable 1938 period.

New Members in Metals Section of Safety Council

■ New members in the metals section, National Safety Council, Chicago, include: Baker Mfg. Co., Harvard Park, Springfield, Ill., W. C. Staley, vice-president; Bradley Pulverizer Co., 123 South Third street, Allentown, Pa., W. A. Gibson, works manager; Detroit Brass & Malleable Works, Seventh & Elm streets, Wyandotte, Mich., John Jay, charge of first aid; Thomas Laughlin Co., 143 Fore street, Portland, Me., O. S. Payson, vice president; Tool Steel Gear & Piston Co., Township avenue, Elmwood place, Cincinnati, J. A. Hight, safety director; Weil McLain Co., Blaime street, Michigan City, Ind., S. A. Lauer, employment manager.

Road Builders' Show in Chicago in January

■ American Road Builders' association will conduct its annual convention and road show at the International Amphitheatre, Chicago, Jan. 29-Feb. 2. "Roads to Recovery" will be the theme of the meeting. Charles M. Upham, 914 National Press building, Washington, is managing director of the association.

LABOR

CIO DENIED INJUNCTION AGAINST STATE LABOR BOARD

■ PETITION by CIO unionists for an injunction restraining the new Wisconsin labor relations board from intervening in their strike at Allen-Bradley Co.'s Milwaukee plant was denied last week by federal court at Madison, Wis.

Decision cleared the way for an action in Milwaukee circuit court by the board to enforce its recent order (STEEL, July 24, p. 19) directing the union to end mass picketing of the plant, limit pickets to 15 at any one time, and cease intimidating nonstriking employes.

RETAIN BAR IRON WAGE SCALE FOR NEXT YEAR

Western Bar Iron association and the Amalgamated Association of Iron, Steel and Tin Workers at their annual wage conference agreed the scale of wages to be paid in 1939-40 will be unchanged from that paid in 1938-39.

Last scale year's agreement expired June 30, and since then mills affected have been operating under the "continuous scale" agreement.

Card rate for August on boiling, bar and 12-inch mills will be 2.15 cents; for guide and 10-inch mills, 2.25 cents.

See Recovery in Public's Unspent Income Reserve

■ Principal hope for substantial business recovery this year rests in the public's "unspent income reserve," according to Economics Consultants, New York, advisory economists. Their report defines unspent income reserve as "the difference left after subtracting total retail sales from total income available for retail purchasing."

Unspent income reserve reached its 1939 peak at $1,041,000,000 at the close of March, subsequently dropped to $884,000,000 as of June 1 due to improvement in automobile sales and generally increased consumption. Optimism for the fourth quarter, the analysis states, is based on the premise there will be no slump in steel activity and that reserve buying power will make itself felt following Labor Day and through the rest of the year.

■ Michigan Hydraulic Steel Co., Dearborn, Mich., has been organized to specialize in compressing auto sheet scrap. Frank G. Tuschman, formerly with the Kasle Iron & Metal Co., and more recently with I. Gerson & Sons Inc., Toledo, O., is general manager of the new company.

June Exports Up 28.5 Per Cent

■ EXPORTS of iron and steel products, excluding scrap, in June totaled 189,968 gross tons, 28.5 per cent higher than May shipments of 147,760 tons, according to metals and minerals division, bureau of foreign and domestic commerce. In June, 1937, exports were 150,037 tons.

June exports were valued at $13,789,887, compared with May valuation of $11,661,926 and with value of $10,798,272 in June, 1938. Aggregate exports for six months were 923,275 tons valued at $70,254,297, lower by 17 per cent in quantity and 6.7 per cent in value than the 1,117,434 tons valued at $75,314,758 exported in the comparable 1938 period.

Canada was the chief market in June with a total of 21,854 tons, including 4053 tons of shapes, 3920 tons of nonalloy black steel sheets and 2474 tons of tin plate. Sweden was second with 19,276 tons, including 7594 tons of plates, 3332 tons tin plate, 3050 tons shapes, and 2950 tons pig iron. The Netherlands were third with 12,546 tons, Brazil fourth with 10,695 tons and China fifth with 10,515 tons.

Tin plate was the largest item exported, 25,718 tons, with nonalloy plates second at 25,507 tons. Nonalloy black steel sheets totaled 20,137 tons and nonalloy steel bars 11,308 tons.

Scrap shipments in June at 398,888 tons valued at $5,692,273, compared with 384,881 tons valued at $5,638,013 exported in May, and with 162,066 tons valued at $2,231,681 in June, 1938.

Scrap exports for six months totaled 1,788,952 tons valued at $26,262,850, compared with 1,798,313 tons valued at $28,602,737 in first half, 1938. Japan took 178,462 tons of June scrap exports, other leading purchasers being the United Kingdom, 80,560 tons; Italy, 50,662 tons; Canada, 37,489 tons; Poland and Danzig, 29,615 tons.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	June 1939	May 1939	Jan. thru June,'39
Pig iron	7,689	6,737	27,933
Ferromanganese and spiegeleisen	2	2	38
Other ferroalloys	293	141	677
Ingots, blooms, etc.:			
Not containing alloy	8,402	6,927	49,164
Alloy, incl. stainless	252	18	6,608
Steel bars, cold fin.	414	571	3,762
Bars, iron	43	23	311
Bars, concrete	2,756	1,891	13,647
Other steel bars:			
Not containing alloy	11,308	8,966	54,505
Stainless steel	5	5	193
Alloy not stainless	1,045	2,108	7,394
Wire rods	3,564	1,881	10,603
Boiler plate	156	377	2,808
Other plates, not fab.:			
Not containing alloy	25,507	20,611	127,387
Stainless steel	4	14	40
Alloy, not stainless	285	141	687
Skelp iron or steel	1,009	711	4,637
Sheets, galv. iron	298	382	2,663
Sheets, galv. steel	7,948	6,854	43,522
Sheets, "black" steel:			
Not containing alloy	20,137	18,761	132,425
Stainless steel	63	109	433
Alloy, not stainless	164	518	1,545
Sheets, black iron	561	630	3,337
Strip steel, cold-rolled:			
Not containing alloy	1,374	1,007	9,452
Stainless steel	55	47	291
Alloy, not stainless	31	83	231
Strip steel, hot-rolled:			
Not containing alloy	3,605	4,436	24,206
Stainless steel	3	2	151
Alloy, not stainless	15	5	30
Tin plate, taggers' tin	25,718	16,124	98,955
Terneplate	386	376	1,929
Tanks, except lined	4,763	2,020	13,561
Shapes, not fabricated	10,030	6,891	41,669
Shapes, fabricated	3,226	2,626	16,052
Plates, fabricated	1,157	108	2,161
Metal lath	83	50	477
Frames and sashes	85	81	502
Sheet piling	1,119	236	2,935
Rails, 60 lbs.	5,243	2,947	24,807
Rails, under 60 lbs.	470	588	1,589
Rails, relaying	3,223	1,649	6,712
Rail fastenings	1,272	598	4,637
Switches, frogs, crsgs.	237	194	1,294
Railroad spikes	159	266	1,673
R.R. bolts, nuts, etc.	115	70	781
Boiler tubes, seamless	872	590	3,491
Boiler tubes, welded	31	105	248
Pipe:			
Smls. casing, oil-line	4,829	6,649	30,620
Do., welded	188	53	1,317
Seamless black	740	802	3,740
Pipe fittings:			
Mall. iron screwed	344	307	1,801
Cast-iron screwed	367	190	1,190
Pipe and fittings for:			
Cast iron pressure	3,798	377	12,362
Cast iron soil	883	434	3,755
Pipe, welded:			
Black steel	1,486	1,482	8,312
Black wrought iron	100	144	1,444
Galvanized steel	1,504	1,664	10,537
Galv. wrought iron	400	194	1,525
*All other pipe, fittings	526	370	2,068
Wire:			
Plain iron or steel	2,346	1,851	12,606
Galvanized	3,028	1,686	12,922
Barbed	4,871	3,600	19,817
Woven wire fencing	268	257	1,534
Woven wire screen cloth:			
Insect	26	46	211
Other	123	100	701
Wire rope and cable	212	262	1,894
Wire strand	43	69	460
Electric welding rods	185	113	748
Card clothing		1	24
Other wire	1,059	542	3,827
Wire nails	2,035	1,528	9,250
Horseshoe nails	67	102	428
Tacks	30	20	132
Other nails, staples	482	305	1,953
Bolts, machine screws	719	645	3,995
Castings:			
Gray iron (incl. semisteel)	317	194	1,757
Malleable iron	41	82	564
Steel, not alloy	128	58	525
Alloy, incl. stainless	123	166	737
Car wh'ls, tires, axles:			
†Wheels and tires	556	677	4,868
†Axles, no wheels	917	1,416	4,631
†Axles with wheels	1,081	200	2,534
Horseshoes and calks	5	.....	125
Forgings, n.e.s.:			
Not containing alloy	666	1,460	4,972
Alloy, incl. stainless	348	237	1,226
Total	189,968	147,760	923,275
Scrap, iron and steel	397,371	382,642	1,776,015
Scrap, tin plate	282	728	4,300
Tin plate circles, strips, cobbles, etc.	450	656	3,507
Waste-waste tin plate	835	855	5,130
Total scrap	398,888	384,881	1,788,952
GRAND TOTAL	588,856	532,641	2,712,227
Iron ore	79,064	54,743	201,332

*New class. Includes flanged malleable cast-iron fittings, expansion joints, and riveted pipe and fittings.
†New class.

Inland Carrier Breaks Own Cargo Record

■ The steamer L. E. BLOCK, flagship of the Inland Steel Co. ore freighters, again has broken the record for carrying the largest cargo of iron ore. She loaded 15,778 gross tons at Superior, Wis., Saturday, July 22, breaking her own record cargo made in June of this year.

Industrial Machinery Exports Decline in June

■ United States exports of industrial machinery in June were valued at $22,573,175, a decline of 3 per cent from $23,203,415 exported in June, 1938, according to the machinery division, department of commerce. Losses in power generating machinery, power-driven metalworking and mining, well and pumping machinery were almost offset by substantial gains in all other types.

For six months American machinery exports totaled $141,384,366, compared with $142,216,348 for the like period in 1938. Power-driven metalworking machines, textile and miscellaneous types showed gains in the half-year.

Smaller shipments in most classes of metalworking machinery resulted in a decrease of 27 per cent, from $8,000,189 in June, 1938, to $6,660,447 in June, this year. On the other hand metalworking machinery other than power-driven increased 26 per cent, from $320,866 in June, 1938, to $403,905 in June, this year.

Farm Equipment Sales Abroad Make Gain

■ Farm equipment exports in June were valued at $7,334,077, a gain of 4 per cent over valuation of $7,042,941 in June, 1938, according to the machinery division, department of commerce.

Tractors, parts and accessories, valued at $4,387,011, showed a gain of 7 per cent over $4,104,863. Wheel tractors were up 3 per cent and track-laying tractors 4 per cent. Tillage implements showed a loss of 12 per cent.

Formulate Program for Machine Tool Congress

■ Program for the Machine Tool Congress to be held in conjunction with the National Machine Tool Show in Cleveland, Oct. 4-13, was being formulated last week by participating organizations. These include the National Electrical Manufacturers' association, American Society of Mechanical Engineers, National Foremen's association, American Foundrymen's association, Associated Machine Tool Dealers of America, Cleveland Engineering society, Society of Automotive Engineers, American Society of Tool Engineers Inc. and National Machine Tool Builders' association.

Purpose of the congress is to provide a series of discussions on subjects related to and connected with machine tools and mechanization. Detailed programs will be published in STEEL, Sept. 25.

What's New at Pittsburgh . . .

By R. L. HARTFORD
Pittsburgh Editor, STEEL

■ EXPANSION and modernization programs in the Wheeling district rapidly are nearing completion. Both major companies in the area, Wheeling Steel Corp., with plants at Beech Bottom, Benwood and Wheeling, W. Va., and Martins Ferry, Portsmouth, Steubenville and Yorkville, O., and Weirton Steel Co., with plants at Clarksburg and Weirton, W. Va., and Steubenville, O., have such programs.

In addition to its structural mill, soon to be described in these pages, Weirton has gone ahead on a 2-stand tandem cold mill and a 4-stand tandem temper mill. Feature of these mills is increased speed, up to 3000 feet per minute on the finishing mill. Electrical equipment on the temper mill includes four mill motors aggregating 5000 horsepower, a 300-horsepower reel motor, a 5000-kilowatt motor generator set with a 650-kilowatt auxiliary.

Wheeling also is contemplating increased cold finishing capacity in its sheet mills. Two present skin pass mills at Steubenville are being improved to provide higher capacities and better finishes. Also included in expansion plans are a 4-stand 64-inch continuous cold mill and extensive work on the hot mill.

Wheeling is expanding the galvanizing department at Steubenville. Four new lines have been installed and four more are about ready to go in. Many more are contemplated, and when completed will make this one of the largest and most modern galvanizing plants in the world. Equipment is of a new type developed by Wean Engineering Co., and is said to be low in dross formation as well as imparting an attractive finish to the sheets.

Similar units recently were supplied to Tata Iron & Steel Co., Jamshedpur, India.

BLAW-KNOX TO MAKE TURBINE PIPING FOR EASTERN PROJECT

An interesting order recently was received by Power Piping division, Blaw-Knox Co., for high-pressure, high-temperature steam turbine piping for an eastern power plant development.

Turbine piping will be carbon molybdenum steel and specifications call for radiograph of all welds, with full furnace heat treatment of all assemblies after welding to provide

(*Please turn to Page* 56)

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended July 29	Change	Same week 1938	Same week 1937
Pittsburgh ...	50	+ 2	29	83
Chicago	56	+ 2.5	37.5	85
Eastern Pa. ..	41	None	28	71
Youngstown ..	54	+ 1	38	80
Wheeling	79	None	46	92
Cleveland	73	+17	23	82
Buffalo	51	+ 4.5	37.5	88
Birmingham ..	84	+ 3	53	96
New England..	40	None	38	90
Cincinnati	31	None	50	93
St. Louis	47.5	None	24.5	80
Detroit	64	None	38	92
Average	60	+ 3.5	37	84

Republic Strengthens New York Ore Holdings

■ Republic Steel Corp., Cleveland, has signed a 25-year lease with the Chateaugay Mining Co. for the operation of the Chateaugay mine in northern New York.

Located at Lyon Mt., New York, between Plattsburg and Malone, the mine has been in operation for more than 75 years, produces approximately 500,000 tons of ore annually. Substantial acreage was involved in the lease.

Because of intermittent operations and lack of outlet for waste gases the blast furnace which is operating in connection with the mine will be closed and Chateaugay ore converted into iron at Buffalo. Pig iron molds used at the Chateaugay blast furnace will be shipped to Buffalo.

J. R. Linney, vice president of the mining company, will join Republic; Robert Linney will continue in charge of the mine's operation, and William Linney, who had charge of the Chateaugay blast furnace, will join the Republic blast furnace department in Buffalo where he will supervise the production of pig iron from Chateaugay ore.

Republic will take over operation of the new properties on Aug. 1.

Lease of the Chateaugay property follows the corporation's lease of the Port Henry, N. Y., iron mines a little more than a year ago.

■ Industry was urged last week to join the fight against venereal disease, an industrial hazard costing "tremendous sums" each year. In a report of its Committee on Healthful Working Conditions, the National Association of Manufacturers, New York, asserted every company without an active program for identifying and preventing venereal disease is losing an appreciable amount in production and income.

PRODUCTION

■ STEELWORKS operations last week rose 3.5 points to 60 per cent, the highest since mid-December, nearly eight months ago. Six districts showed increases, six no change. A year ago the rate was 37 per cent; two years ago 84 per cent.

Youngstown, O. — Increase of 1 point to 54 per cent with 46 open hearths and three bessemers in production. Two open hearths were added by one interest and one dropped by another producer. Schedule for this week indicates a slight drop.

Chicago — Advanced 2.5 points to 56 per cent, the highest since the week of March 6.

Detroit—Unchanged at 64 per cent for the third consecutive week, 16 of 25 open hearths being active.

St. Louis — Continued at 47.5 per cent with no indication of change this week.

Birmingham, Ala.—Up 3 points to 84 per cent, with 18 open hearths in production.

Central eastern seaboard—Steady at 41 per cent for the second week, with no indication of material change.

Pittsburgh—Rise of 2 points to 50 per cent, best rate since the middle of March.

Wheeling — Holds at 79 per cent for the third consecutive week.

Buffalo — Upturn of 4.5 points to 51 per cent resulted from relighting two open hearths. Indications are for a further increase this week.

Cincinnati — Remains at 31 per cent, though finishing mills are at about 60 per cent, ingot stocks being drawn on.

New England—For the third consecutive week unchanged at 40 per cent with the same rate expected this week.

Cleveland—Soared 17 points to 73 per cent, peak for the year to date, on sharp increases by two mills. A steady trend is in immediate prospect.

Youngstown To Build Continuous Tube Mill

■ Youngstown Sheet & Tube Co. plans to begin construction immediately of a new continuous buttweld tube mill at its Campbell plant, Campbell, O.

Authorized by directors recently, mill is to be of the Fretz-Moon type, is understood to cost between $200,000 and $250,000. Work will proceed as rapidly as the equipment can be delivered. Contract has not yet been let. Mill will produce buttweld pipe ranging from one-half inch to 3 inches in diameter.

MEN OF INDUSTRY

■ L. GERALD FIRTH, president, Firth-Sterling Steel Co., McKeesport, Pa., has been elected president, American Carbide Alloys Corp., a newly acquired and wholly owned subsidiary of Firth-Sterling. G. A. Jacobs, of Firth-Sterling's Detroit office, has been made first vice president; W. H. Lolley, New York, second vice president; Clyde N. Gillespie, McKeesport, treasurer; H. R. Huemme, McKeesport, secretary; R. H. Hallagan, Detroit, assistant secretary and assistant treasurer, and George Knaepper, Detroit, chief engineer. Messrs. Lolley and Knaepper have been associated with the American Carbide corporation. Main office and works of the corporation will be in Detroit.

♦

S. J. Horrell, assistant sales manager, power piping division, Blaw-Knox Co., Pittsburgh, has been advanced to the post of sales manager.

♦

H. B. Hayden, who has retired as treasurer, David J. Joseph Co., scrap iron and steel broker, Cincinnati, after 40 years active service with the company, was honored recently at a luncheon given by his associates, at which time he was presented with a wrist watch.

♦

C. R. Payne, the past four years in charge of research, Atlas Mineral Products Co., Mertztown, Pa., has been elected vice president and a director. Seven years prior to 1935, Mr. Payne was associated with the Mellon Institute of Industrial Research. Raymond B. Seymour, formerly with Goodyear Tire & Rubber Co., Akron, O., has joined the research staff of the Atlas company, and will devote his time to the development of corrosion proof materials of construction.

L. Gerald Firth

♦

T. J. Knapp has been named assistant sales manager, Freeport Sulphur Co. Mr. Knapp, who has been with Freeport 17 years, was first appointed superintendent of shipping at the company's headquarters in Freeport, Tex., in 1922, and since 1930 has been traffic manager at the company's New York office.

♦

Joe C. Danec, chemical engineer, has joined the technical staff of Battelle Memorial institute, Columbus, O., and been assigned to the division of process metallurgy. Mr. Danec is a member, American Society for Metals and American Chemical society.

♦

Frederick A. Searle has resigned as vice president and a director, Landers, Frary & Clark, New Britain, Conn., due to ill health. He had been with the company 39 years. Arthur E. Allen, a former vice president of Westinghouse Electric & Mfg. Co., has been elected to succeed Mr. Searle as a director.

♦

T. H. Booth has been made Cleveland district sales manager, Edgar T. Ward's Sons Co., division of Columbia Steel & Shafting Co., Pittsburgh. He succeeds G. E. Parker, who has been made manager of sales, commercial division, Summerill Tubing Co., Bridgeport, Pa. Mr. Booth has been with Edgar T. Ward's Sons Co. a number of years in various capacities, the past three in the Cleveland office.

♦

Wayne Mendell has been appointed to supervise sales activities of the DeBothezat Ventilating Equipment division and other divisions of American Machine & Metals Inc., in the Chicago area, with headquarters at 35 East Wacker drive. Mr. Mendell was formerly president, Fletcher Machinery Corp., and vice president and general sales manager, U. S. Hoffman Machinery Corp.

♦

John R. Cox, former director of manufacturing, Thompson Products Inc., Cleveland, has been named vice president and general manager, Weatherhead Co., Cleveland, automotive parts maker. At one time Mr. Cox was president, Cleveland Piston Co. and Cox Tool Co. A. A. Abramaska, former chief tool designer of Thompson Products, has also joined the Weatherhead firm.

♦

Jed S. Foster, vice president and chief engineer, Lidgerwood Mfg. Co., Elizabeth, N. J., was honored at a testimonial dinner held in the Winfield Scott hotel, July 6, in recognition of 50 years of active service with the company. Mr. Foster, well known in this country and abroad for his engineering activities, joined Lidgerwood in July, 1889. He was presented a brace of pipes and a gold medallion inscribed "Fifty Years of Meritorious Service—1889 to 1939—Lidgerwood Mfg. Co." Mr. Foster will continue actively in his capacity of vice president and chief engineer.

♦

Newton S. Hoerle, heretofore production engineer, Carrier Corp., Newark, N. J., has been appointed factory manager, Easy Washing Machine Corp., Syracuse, N. Y. Prior to joining Carrier in 1936, Mr. Hoerle spent five years in Russia, where he was in complete charge of a So-

Celebrates 80th Birthday

■ **Alexander Glass, since 1920 chairman of the board, Wheeling Steel Corp., Wheeling, W. Va., was honored at a party tendered him at the home of W. W. Holloway, president of Wheeling Steel, on the occasion of his eightieth birthday July 24. Long time associates and friends attended. Dean of the steel industry, Mr. Glass is actively engaged in the sixty-sixth year of his steelmaking experience. He began as a nail mill apprentice, feeder, nailer with LaBelle Iron Works**

viet factory at Stalingrad for one year, following which he was transferred to Moscow as chief engineer, Scientific Research institute of the Soviet automotive and tractor industry.

♦

Henry R. deHoll has retired as general superintendent, Indiana Harbor works of Inland Steel Co., effective Aug. 1, after 26 years of service with the company. He will retain his connection with Inland in a consulting capacity. Mr. deHoll became associated with Inland in 1912, first as superintendent of coke plants, then in charge of blast furnaces and coke plants, and has been general superintendent for nine years. Previous to joining Inland he was with Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

♦

John E. Snowberger, assistant master mechanic, Willys-Overland

John E. Snowberger

Co., Toledo, O., and active with the company 19 years, has been made works manager. Serving his apprenticeship in toolmaking and engineering at the Landis Grinding Machine Co., Waynesburg, Pa., he joined Willys in 1920, in charge of the tool and die design department. Prior to his automotive affiliations, he was associated with Pratt & Whitney Co., Hartford, Conn., and Savage Arms Co., Utica, N. Y.

♦

C. D. Marshall, chairman of the executive committee, board of trustees, Koppers United Co., Pittsburgh, has resigned. To succeed Mr. Marshall as chairman, J. T. Tierney has been elected to that position. He also continues as president. Mr. Marshall retains his membership on the board. Mr. Tierney will also be chairman of the board, Koppers Co., resigning his position as president of this principal operating unit of the Koppers organization. J. P. Williams Jr., vice president of

Henry R. deHoll

Koppers United Co. and president of Koppers Coal Co., has been elected president of Koppers Co., succeeding Mr. Tierney. Mr. Williams will serve also as executive vice president of Koppers United Co.

♦

Morris E. Lowder has been named general manager of sales, Superior Steel Corp., Pittsburgh, effective Aug. 1. He has been with the company since January, 1931, and prior to his new appointment was district manager in Chicago. Fred K. Myers, who joined Superior in November, 1933, as a sales clerk, has been appointed manager of carbon steel sales. Walter G. Blume has been made manager of stainless steel sales. He joined the firm 22 years ago as a stenographer and clerk.

♦

Hutson Colcock has been appointed agent of conduit products in the New Orleans district for Steel & Tubes Inc., Cleveland, a Republic Steel Corp. subsidiary. Since 1934 he has acted as a manufacturer's agent in New Orleans and surrounding territory specializing in lighting and wiring. He will represent Steel & Tubes in all of Louisiana, except Caddo and Bossier parishes, the southern part of Mississippi and Alabama, and the western section of Florida. He is located at 828 Burdette street.

DIED:

■ DAVID BLAIR MORROW, 47, secretary-treasurer, Globe-Wernicke Co., Cincinnati, July 22 at his home in that city. Mr. Morrow joined the company in 1933 as vice president and secretary. He was made secretary-treasurer four years ago. Mr. Morrow started his career with the United States Steel Corp. at Gary, Ind. Later he served with the Brier Hill Steel Corp., Girard, O., and as assistant to vice president, General Fireproofing Co., Youngstown, O. Before going to Cincinnati he was comptroller, Berger Mfg. Co., Canton, O.

♦

Albert Edward Wright, 48, purchasing agent, Bowen Products Corp., Detroit, in that city recently.

♦

Hugh Lee McComb, Ohio manager of Essex Wire Corp., Detroit, at his summer home in Grand Lake, Mich., July 19.

♦

L. G. Aughinbaugh, treasurer, Stevenson Co., Wellsville, O., in Youngstown, O., July 18. He had been with the firm 22 years.

♦

Carl Lager, 69, president, Morris Machine Works, Baldwinsville, N. Y., at his summer home near Old Forge, N. Y., recently.

♦

C. C. Edmunds, chairman of the board, McLain Fire Brick Co., Pittsburgh, in Atlantic City, N. J., July 27, while on vacation. He was also a director, charter member and treasurer, American Refractories institute, since its formation.

♦

J. Howard Albrecht, in Pittsburgh, July 27. Mr. Albrecht was well known in steel mill circles, representing D. B. Flower Mfg. Co. and Calabaugh Self-Lubricating Brush Co. in the Pittsburgh district. He had been an associate member, Association of Iron and Steel Engineers, for 25 years.

♦

Allison J. Thompson, 74, July 25 in Cleveland. Mr. Thompson was a founder and former president, Thompson Electric Co., Cleveland, and for many years was a leading figure in engineering circles in that city. He was an honorary member, Illuminating Engineering society, and belonged to the Association of Iron and Steel Engineers, Cleveland Engineering society, and Cleveland chamber of commerce.

♦

Henry D. Shute, 67, former vice president, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., at his home in Miami, Fla., July 15. He was associated with the company 38 years before his retirement in 1931. Starting as a student-apprentice, he served in various capacities in the engineering, sales and departmental lines, and in 1906 was made assistant vice president. Subsequently he became acting vice president; treasurer; vice president in charge of sales, and in October, 1925, his duties were changed from sales organization to direction of broader commercial policies of the company, the position he held until his retirement.

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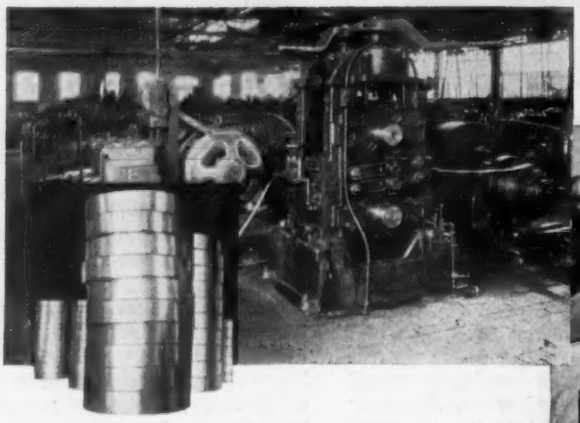

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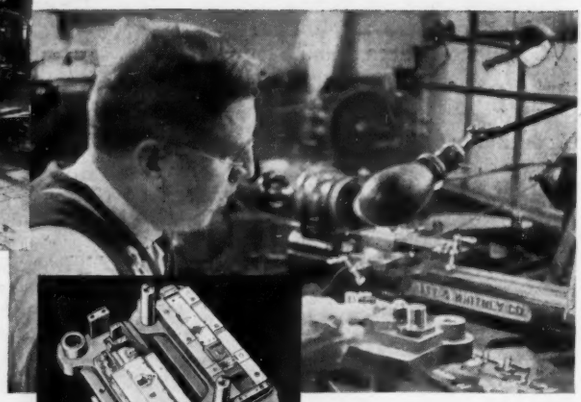

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Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ REDUCED taxes, less government spending and less interference with business are widely considered prime requisites for prosperity, according to a nation-wide survey just completed by National Association of Manufacturers. Survey also revealed the public believes business must be the motivating force toward recovery.

Survey was by an organization of experts and the number of interviews was larger than the average of this type, to assure a more detailed analysis of occupational thinking. The aggregate was weighted scientifically to represent an accurate cross-section of the nation. Another section of the survey is being compiled, dealing with public opinion toward business and other problems.

Answers indicated belief prosperity would be increased if government spending were: Decreased, 58 per cent; let alone, 23 per cent; depends, 8 per cent; increased, 6 per cent; don't know, 5 per cent.

Low Earners Favor Spending

Analysis of the answers revealed a trend showing that as the respondents went down the income scale the percentage desiring an increase in spending became larger. Of those favoring increased spending the average increased to 9.6 per cent among wage earners and 17.1 per cent among unemployed. Despite this, even among those in the lowest income levels, including those on relief, the vote was four to one against greater spending. In the case of those with incomes from $1200 to $5500, it was 15 to one in opposition. Of the farmer vote only 1.4 per cent favored more spending.

On the question of taxes as related to prosperity, answers showed belief that taxes should be: Lowered, 48 per cent; let alone, 36 per cent; depends, 9 per cent; raised, 2 per cent; don't know, 5 per cent.

Commenting on this showing the association says: "It might be assumed that more people would be for lower taxes than for decreased spending, for taxes affect more individuals personally and directly. But the contrary is true, showing evidence that people realize that spending makes taxes and that spending must be cut before taxes. If the public had direct control, realistic budget-balancing would start at once."

Another question asked the first necessity for increased prosperity. Results: Government let business alone, 36 per cent; increase production, 24 per cent; pensions after 60, 20 per cent; improved conditions in the South, 6 per cent; unemployment insurance benefits, 5 per cent; don't know, 7 per cent; other reasons, 6 per cent. The aggregate is more than 100 per cent because two reasons were given by many who responded.

More than one-third believed the most important contribution was to have government let business alone, but with more than one-fourth thinking increased industrial production most necessary, the public apparently expects industry to take some initiative, once it is let alone, the association says in its analysis.

"The 20 per cent who mention pensions and the 5 per cent who specify unemployment insurance benefits," says the report, "show about the same proportion depending on the government purchasing power theory as on increased industrial production. The small number of 'don't knows' indicates that people are thinking on the matter of national recovery and that it is one of the nation's foremost questions, on which they have formed opinions."

NEW LAWS PERMIT EQUIPMENT BUYING WITHOUT BIDS

Competitive bidding may be abandoned on federal contracts for aircraft parts, instruments and accessories under a bill signed last week by the President.

Law provides that in event aircraft components are needed by the war department, if it is in the national interest not to disclose the purchase, chief of the air corps may buy such equipment without taking bids. No purchase shall be made, however, until the secretary of war "shall have certified that a secret order is necessary," and then only after submitting the proposal to three reputable concerns for test bids.

Another bill passed by congress and signed last week by the President authorizes the secretary of war "to purchase abroad or in the United States with or without competition, by contract or otherwise, such ordnance, signal and chemical-warfare equipment, supplies, parts, accessories, or designs thereof, as may be necessary in his judgment for experimental or test purposes in the development of the best kind of equipment and supplies required for the national defense."

SPEND-LEND PROGRAM PLANS MUCH AID TO RAILROADS

The President's spending-lending program includes, as favorably reported by the banking and currency committee of the senate, $350,000,000 for nonfederal public works; $500,000,000 for loans for rural electrification; $600,000,000 for loans to farm tenants, etc.; $350,000,000 for financing through loan, lease, or otherwise the purchase or construction of new railroad equipment by carriers and the acquisition of such equipment and the purchase, rebuilding, repair or disposition of old railroad equipment; $500,000,000 for the construction of bridges, express highways, etc.; $90,000,000 for the continuation of the construction of reclamation projects; and $100,000,000 for the financing of foreign trade.

The section of the bill relating to railroad equipment is designed to revive what is perhaps the most depressed of all the heavy capital goods industries. During the course of the hearings it was developed that

much of the existing equipment, both rolling stock and railroad machine shops, is aged and obsolete. Over 40 per cent of the freight cars and 70 per cent of the steam locomotives are over 20 years of age. Only 3 per cent of the locomotives were purchased in the past ten years.

The annual repair cost on this old equipment is very high, particularly in view of the state of the machine-shop equipment. If sufficiently attractive terms could be arranged, the railroads could make large annual savings in repair and operating costs through modernization of equipment.

The present bill extends the power of the reconstruction finance corporation to make loans for this purpose and, in addition, makes it possible for railroads to acquire new equipment or to finance major rebuilding programs through a leasing arrangement. The disposal of obsolete equipment can also be facilitated. The leasing arrangement is currently being utilized to a limited extent as between equipment makers and railroads. It permits certain types of financing not now possible under a straight loan. The reconstruction finance corporation will purchase equipment only upon the agreement to lease and upon the specifications of individual roads. Under these additional powers it will be possible for the reconstruction finance corporation to accommodate itself to the varying necessities of differently situated roads for different types of equipment more effectively than is possible at present.

RULES ANNOUNCED FOR TIN PLATE SCRAP EXPORTS

Additional allotments for exportation of tin plate scrap during the present calendar year will be considered by the national munitions control board of the state department.

In reference to the procedure for obtaining export permits, the control board says:

"Additional allotments will be granted to producers of tin plate scrap only and will be assigned in the order of the receipt of requests therefor, provided that, in the event that it shall be necessary in order that the quantity of tin plate scrap to be exported during the calendar year 1939 shall not exceed the total figure agreed upon by the national munitions control board, the available balance of such total shall be apportioned among the applicants on the basis of their production during the first six months of 1939.

"Allotments will be based on the individual producer's request therefor, with the provision that no allotment of more than 25 long tons shall exceed in amount 20 per cent of the quantity of tin plate scrap produced by him during the first six months of the calendar year 1939. No allotment assigned under the provisions of this paragraph to any one producer, including his affiliated or associated companies, shall exceed 1000 long tons. Requests for allotments of 25 long tons or less may be granted in full, subject to the qualifications set forth in the following paragraph.

"No producer shall be eligible to receive an allotment under the provisions of paragraph (5) of the rules of procedure until the secretary of state has received from him a sworn statement setting forth the quantity of tin-plate scrap, in long tons, produced by him during the first six months of the calendar year 1939, provided that requests for 25 long tons or less may be granted in full, without reference to the quantity of tin plate scrap produced during the first six months of 1939, if the producer concerned presents convincing evidence, in the form of a sworn statement, establishing that he will, so far as can be foreseen, produce during the calendar year 1939 at least the equivalent of the allotment requested by him in excess of the total of any allotments previously assigned to him for export during the calendar year 1939. Sworn statements submitted under the provisions of this paragraph shall include the name and address of the producer, the name and location of each factory, and the quantity of tin-plate scrap produced at each factory."

During June six tin plate scrap licenses were granted for exportation of 180 tons to Japan, valued at $3323, according to the state department. During the first six months of this year 87 such licenses have been issued for a total of 4752 tons, valued at $87,943.25.

LAFOLLETTE BILL AIMED AT STRIKE BREAKERS

In connection with hearings covering a period of many months before the civil liberties subcommittee of the senate, Senator LaFollette, Wisconsin, chairman, and Senator Thomas, Utah, introduced what they call the oppressive labor practices bill. Last week a favorable report was made on this bill by the committee on education and labor, of which the LaFollette committee was an offshoot.

This bill describes as oppressive labor practices and prohibits the use of labor spies; the use of strike breakers and strike breaking agencies; the use of armed private police off company property; and the private possession or use of industrial munitions, including machine guns, sawed-off shotguns, and bombs containing chemical gases.

In the favorable report on this bill the committee in discussing the need for legislation says:

"The committee believes that enactment of this bill will go a long way toward eradicating the malignant practices against which the bill is directed. Witnesses expert in the techniques of the labor spy and of the professional strikebreaker inform the committee that the commercial detective agencies and the strikebreaking underworld are even now resuming the activities which were temporarily halted by the investigation conducted under S. Res. 266.

"The history of the investigation conducted under S. Res 266 discloses flagrant contempt for the processes of the senate and repeated violations and evasions of state and federal statutes by those engaged in labor spying and kindred occupations. That attempts to evade the law will continue is confirmed by the testimony of the secretary of a large local employers' association. Appearing as a witness during the investigation under S. Res. 266, he asserted that the deterrent effects of that investigation had been 'more apparent than real' and that every day there were brought to his desk circulars from so-called detective agencies advertising newer and more secret methods of labor espionage. Although mindful of the difficulties likely to attend enforcement of the statute, the committee believes that the bill will bring a large measure of relief and that it will clearly set forth the policy of the United States ultimately to free the country entirely of labor spies, professional strikebreakers, private armies, machine guns and other offensive weapons of industrial warfare."

WALSH-HEALEY PURCHASES OF STEEL, IRON PRODUCTS

Purchases of iron and steel products under the Walsh-Healey act for the week ended July 15 included: Heppenstall Co., Pittsburgh, $18,363.50; United States Pipe & Foundry Co., Birmingham, Ala., $10,027.08; Lynchburg Foundry Co., Lynchburg, Va., $10,302.90; Carnegie-Illinois Steel Corp., Washington, $47,600; (estimated); S. G. Adams Metalware Co., St. Louis, $10,470; Worth Steel Co., Claymont, Del., $22,383.31 (estimated); Central Iron & Steel Co., Harrisburg, Pa., $10,812.50 (estimated); Midland Structural Steel Co., Cicero, Ill., $23,389 (estimated); Butler Mfg. Co., Kansas City, Mo., $34,001.10; Belmont Iron Works, Philadelphia, $22,122; Mine Safety Appliances Co., Pittsburgh, $22,141.88; Great Lakes Steel Corp., Detroit, $12,625; and Carnegie-Illinois Steel Corp., Chicago, $31,559.24.

AVIATION

EXPORTS 31 PER CENT OVER 1938 FOR FIRST FIVE MONTHS

■ CONTINUING at record levels, aeronautical exports amounted to $38,247,054 in the first five months this year, 31 per cent ahead of the corresponding period for 1938. Shipments are expected to show further gains during the remainder of the year as builders speed up deliveries on foreign military bookings.

Licenses were granted in June for shipment to France of airplane engines costing nearly $13,000,000, according to the munitions control board. Within two weeks Glenn L. Martin Co. will begin delivery of 215 attack bombers to the French air ministry, currently our best aeronautical customer.

Recently-arrived envoys of the Norwegian air force are touring aircraft plants with view to placing orders for pursuit and other military planes. Previous awards from Norway have been confined to small numbers of passenger craft.

Evincing great interest in large American transports are the foreign commercial carriers. Royal Dutch Airlines ("KLM") is said to contemplate purchasing six 42-passenger Douglas DC-4's, costing nearly $500,000 each.

North American Aviation Inc., Inglewood, Calif., discloses it has booked an order from Canada for 15 training ships. Production is already underway on 200 trainers for Great Britain.

Inroads being made by Germany and Italy into America's aircraft markets were pointed to last week by the Aeronautical Chamber of Commerce of America in a survey of world aviation trade. Although retaining its position as No. 1 exporter, United States was outsold by the two axis powers last year in 18 countries, including six Latin American nations.

Ford Motor Co.'s French division is planning to build a plant in that country for producing Rolls-Royce airplane engines. It is reported all types of precision equipment will be ordered through the River Rouge works. Hispano Suiza has placed with domestic equipment makers large contracts for one of its four aircraft engine factories in France. Other French plane and motor firms will buy American machinery.

Sets Up Foreign Base

Establishment of a parts and service depot at Amsterdam, Holland, is announced by Lockheed Aircraft Corp., Burbank, Calif. A wholly-owned subsidiary, Lockheed International Sales Co., has been created with capital of $100,000, will be equipped with complete servicing and maintenance facilities.

House military affairs committee last week approved the Harter bill relaxing requirements for competitive bidding in the awarding of army airplane contracts. Designed to spread orders so as to engage all available capacity, measure would permit the war department to make awards to any of three lowest bidders, taking into consideration delivery dates and condition of plants as well as prices quoted per unit.

Proposing to extend to the manufacture of all aircraft equipment and accessories except instruments and fabric products the 50-cent minimum hourly wage established late last year under the Walsh-Healey act for builders of planes, engines and major parts (STEEL, Dec. 26, p. 20), labor department's division of public contracts will receive briefs from interested parties until Aug. 7.

Wright Aeronautical Corp., Paterson, N. J., has booked a navy order for engines amounting to $371,269. Contract has been signed with the treasury department by Grumman Aircraft Engineering Corp., Bethpage, L. I., to build for the coast guard four twin-engined amphibian hospital planes costing about $250,000.

Bids soon will be received by Aircooled Motors Corp., maker of Franklin airplane engines, for construction of an addition to its plant estimated to cost more than $40,000.

Instrument to reduce engine overheating and fuel waste has just been introduced by Breeze Corporations, Newark, N. J. Known as an "exhaust gas analyzer," unit is bolted to engine firewall, determines the fuel-to-air ratio for an engine by electrically ascertaining composition of exhaust gases.

Sees "Best Year" Ahead Of Lighting Industry

■ Season of 1939-1940 will be the most prosperous in history of the lighting industry, predicted W. F. White, manager of Westinghouse Electric & Mfg. Co.'s Lighting division, at the fifth annual Lighting School held at firm's Cleveland plant recently. He pointed out Westinghouse lighting business during the first six months this year increased 21 per cent over the first half of 1938.

More than 200 electrical jobbers, manufacturers' representatives and others interested in secondary distribution discussed trends in commercial, industrial, aviation, street and highway lighting, heard speakers summarize these markets.

River Shipments Larger

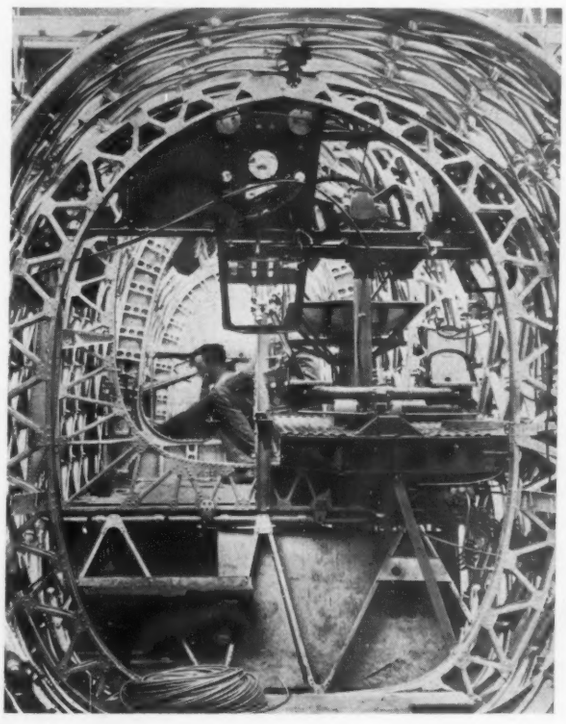
■ June river shipments in the Pittsburgh district gained substantially over May, with coal contributing the largest increase. Steel products declined slightly. Total tonnages:

Steel Products

	June 1939	May 1939	June 1938
Allegheny	2,000	2,900	45
Monongahela ..	53,700	59,150	39,270
Ohio	114,000	129,500	58,350

All Products

	June 1939	May 1939	June 1938
Allegheny ...	229,570	136,000	207,940
Monongahela.	1,687,500	661,100	1,027,380
Ohio	1,265,400	654,950	703,706



Heavy Bomber In British Plant

■ Maze of metal is this fuselage of a Vickers "Wellington" bomber, being built at the Vickers plant in Weybridge, Surrey, England. Employing aluminum strip for its fuselage and wings in a "geodetic" or basketweave construction, the twin-engined craft is designed to fly 3240 miles with full bomb load. In Britain's phenomenally growing aircraft industry, according to reliable estimates, 200,000 workers are now turning out nearly 800 planes a month

Mult-Au-Matics Reduce Cost

Reduce Costs and you can **Reduce Prices. Reduce Prices** and you **increase Unit Sales. Increase Unit Sales Volume** to make **more manufacturing jobs, more administrative jobs, more selling jobs.**

Every manufacturer who turns, faces, bores, drills, reams or threads metal is a potential user of Mult-Au-Matics — if he has an urge to build a greater business. If you are such a man, ask a Bullard Engineer to study your production problems—without obligation, of course.

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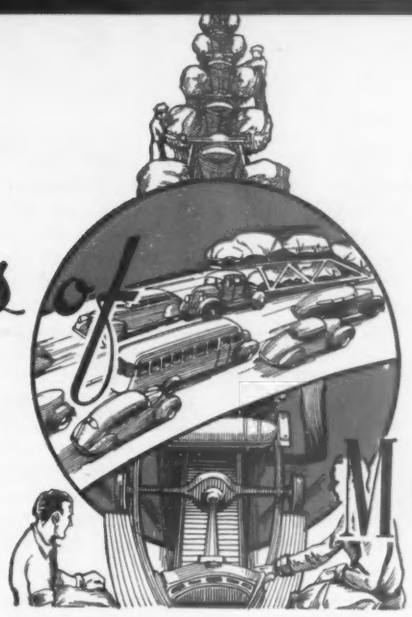

By A. H. ALLEN
Detroit Editor, STEEL

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DETROIT

■ AUTOMOBILE editors from the nation's newspapers and magazines are oiling up their traveling bags in preparation for a busy month of touring in August to take in all the press previews of 1940 models. The lineup for these showings is: Packard, Aug. 8; Nash, Aug. 10; Studebaker, Aug. 15; Chrysler divisions, around Aug. 15; Pontiac, Aug. 23; Buick, Aug. 24; the latter two depending upon whether the strike of tool and die workers in General Motors plants can be settled in time. Originally, the Buick and Pontiac previews were to have been held the same week of the Nash and Packard showings, but a two-week postponement had to be made because of the strike interruption, and last week it appeared a further delay was likely, in view of the fact no progress was being made in settlement of the labor dispute.

Hudson, Willys and the rest of the GM line excepting Chevrolet probably will announce cars to the press sometime in August, which will just about clean up all the unveilings but those of Ford and Chevrolet. The latter two will come around the middle of September. By that time, most of those makers who showed 1940 products in August will have cars in dealers' hands and deliveries to buyers should be well along.

Another preview date was set last week when Fisher Body announced it would show in Toledo, O., on Aug. 7 a new type of "eye glass" developed for motor car bodies in co-operation with Libbey-Owens-Ford Glass Co., Toledo. New glass was perfected after a year's research into causes of driving fatigue, loss of visual efficiency, and responsiveness of the human eye. John D. Biggers, president of Libbey-Owens-Ford; Charles F. Kettering, General Motors vice president in charge of research; and Edward F. Fisher, general manager of Fisher Body, will take part in the preview program.

As the General Motors strike drags out, the effect on other industries becomes more and more serious. Steel shipments cannot be made. Other materials and parts which should be moving into assembly lines now are stalled. Negotiations last week between company representatives and union officials wore on monotonously with apparently little being accomplished except to tighten the deadlock over three principal issues—wage increase of 10 cents an hour; union label on tools and dies made and used by the corporation; and double time for Sundays and holidays.

The latter two demands may be dismissed, for the union realizes they will never be granted, simmering the discussions down to the matter of wages. The corporation's position is that any question of wages, including minimum wages, must be settled locally in each plant; that in view of the fact General Motors' general average wage rate is the highest in the industry there is no justification for wage increases; but that alleged in-

Funching Units Eliminate Costly Cam Dies

■ **Standardized individual punching units mounted on fixtures in multiple make it possible to eliminate expensive cam dies for piercing sheet steel in connection with forthcoming 1940 models. Shown are assembly and final inspection of such punching units at Progressive Welder Co., Detroit**

equalities in individual cases can be negotiated in the plants involved.

W. S. Knudsen, president of GM, summed the matter up by stating that GM "employes are the best paid in the automobile industry, which is substantially the highest paid industry in the country. Unfortunately they, as well as the corporation, are being made the victims of industrial warfare within labor organizations whose internal conflicts involve a factional fight over prestige and power rather than the welfare of the worker.

"Neither faction is willing to submit to an impartial election. The corporation has petitioned the national labor relations board to intervene and settle the factional dispute, and to allow the employes themselves to determine whom they wish to be represented by. The board has rendered no decision as yet.

"Under the circumstances it seems clear that this is a strike conducted by strong-arm methods and does not represent the sentiment of the majority of the workers. There is certainly no justification for a strike in the General Motors plants at this time, and the effort to cause a small percentage of the employes to strike in such a way as to embarrass the corporation at a critical time in its production program is just another example of the tactics of the UAW-CIO."

Labor Showdown Needed

Some sort of a showdown is going to have to be made in this labor mess which affects not only General Motors, but the rest of the industry as well in one way or another. Should the GM dispute be adjusted finally, the UAW-CIO then will turn to some other unit to start another outbreak, for, after all, as the automobile unions are now constituted, the only way they can prolong their existence is to keep stirring up trouble and strikes.

As the record for the past year shows, when the labor waters are calm, union members gradually lose interest and quit paying their dues. Then the only way to whip them back into the fold is to manufacture grievances at some plant, throw a picket line around the gates, call for a federal labor conciliator and start a protracted series of so-called negotiations, hoping that in the meantime the company against which the strike is called will give in to demands to avoid crippling its business.

■ CHANGES and improvements to be made in the Chrysler lines for 1940 are characterized by one observer as more numerous and important than achieved last year, but not so dramatic. By dramatic is meant changes over which an advertising writer can wax ecstatic but which may not be so vital in the performance of the car itself. For one thing, new transmissions will be used in all lines, designed to be practically interchangeable from one make to the other. The transmission is about 8 inches longer than the present unit, and all gears will be given a "wheelabrating" or grit blasting treatment to improve fatigue life. This is an innovation in transmission gears, although the blasting operation has been used on ring gears and pinions. Formerly transmission gears were wire brushed; the new treatment is claimed to be less costly and to provide a much better gear.

One reason the transmission is longer is so that rear axles can be moved back a sufficient distance to permit the use of straight doors on four-door sedan models. Rear doors on these models formerly had to be cut out to pass over the wheel housings. On new bodies the wheel housing will be back far enough to clear the rear door. Extending the transmission permits using a propeller shaft of practically unchanged length.

Other refinements on Chrysler lines will be the application of warning lights on gas gage, oil gage, water temperature gage and ammeter, of the type used this year on speedometers. These new gages are simple in construction and no extra lights are required with them. Needles are mounted on a quadrant which moves with them, and at a certain point in their travel they expose an aperture through which light from dash bulbs can shine and give a warning signal.

Chrysler bodies will be entirely new for 1940 and will be distinguished by a much larger rear window in which curved glass is used to improve visibility. One widespread complaint with many 1939 models, and even those of prior years, has been the difficulty of seeing a sufficient portion of the road behind the car, and dangerous "blind" spots at the rear quarters of the body. Few cars, if any, on the road today have sufficient visibility to permit the driver to pull out of a line of traffic by depending solely on his rear-vision mirror. For safety's sake, he must also look rearward from the window at his left, because the mirror will not show a passing car in the area of the blind spot. Extension of rear windows and curving them with the body should go a long way toward clearing up this complaint.

Running Boards Optional

Running boards probably will be optional on most Chrysler-built cars, the day for their complete elimination not yet being at hand. Front end designs all are modified from the 1939 motif, with considerably less bright metal in evidence.

A trend which has been observed in recent months, not confined to any one particular motor car builder, is the absorbing of manufacture of certain car accessories such as heaters, by the car builders themselves. Hitherto such accessories have been purchased on the outside, built more or less to the car manufacturer's specifications. Now at least a portion of new car heaters will be manufactured right in some of the motor plants.

Several reasons are advanced for this change in policy. One is the old story of dollars and cents. Eyeing the good margin of profit in accessories, the motor makers have decided to pursue the policy of integration a little further and take over some accessory manufacture. Further, of course, heaters are being improved and more specifically adapted to the cars on which they are installed.

There will be further application next year of the principle used by Studebaker on its Climatizer type of heater, installed under the front seat and drawing outside air into the car rather than recirculating air already inside the car.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	227,130	353,946
Feb.	383,900	202,589	312,141
March	519,022	238,598	389,489
April	553,231	238,133	354,263
May	540,377	210,183	313,214
June	521,153	189,399	‡324,235
6 mos.	2,916,869	1,306,057	‡2,047,288
July	456,909	150,444	.....
Aug.	405,072	96,936	.....
Sept.	175,630	89,623	.....
Oct.	337,979	215,296	.....
Nov.	376,629	390,350	.....
Dec.	347,349	407,016	.....
Year	5,016,437	2,655,777	.....

‡Revised.

Estimated by *Ward's Reports*

Week ended:	1939	1938†
July 1	70,663	40,945
July 8	42,784	25,375
July 15	61,610	42,010
July 22	47,420	32,070
July 29	40,595	30,390

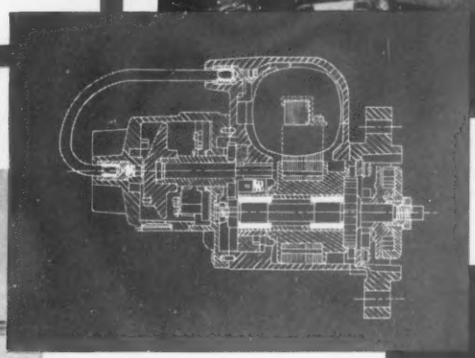
†Comparable week.

	Week Ended July 29	Week Ended July 22
General Motors	15,030	18,450
Chrysler	2,540	5,900
Ford	16,875	17,000
All others	6,150	6,070

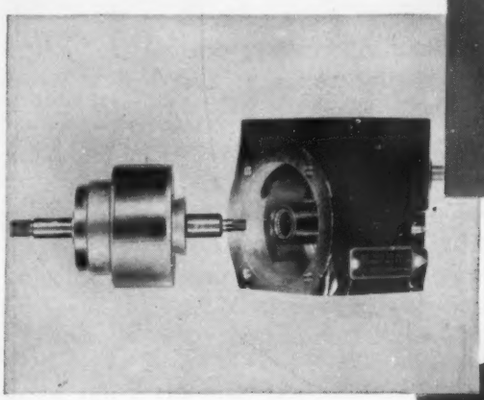
3 YEARS OF CONTINUOUS OPERATION *WITHOUT A SINGLE BEARING FAILURE!*

(*Above*) Torrington Needle Bearings are quickly installed in magnetos on the Wico assembly line.

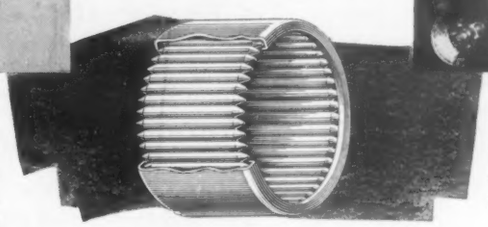
(*Left*) Cross section drawing shows the magneto and the location of the Needle Bearings.



(*Below*) Close-up view shows disassembled magneto unit, with Needle Bearing mounted in the housing.



(*Right*) The Offenhauser Racing Car motors equipped with the Wico Magneto, using Torrington Needle Bearings, operate in excess of 8,000 R. P. M.



THOUSANDS of Wico magnetos operating 24 hours a day have been in service for three years, or even longer—*without a single case of bearing failure!* That is the enviable record chalked up by the Wico Electric Company's magnetos in use in the oil field—and adequate testimony to the service-life of the Torrington Needle Bearings in the Wico magneto.

Performance like that is typical of the Torrington Needle Bearing—for it is engineered for long life under severe conditions. High radial load capacity at high speeds is one of the advantages of the Needle Bearing that contribute to its performance. Made with a full complement of rollers with a small diameter and long axis, the bearing provides many linear inches of contact—with resulting high capacity in even the smallest sizes. Efficient lubrication is another factor in bearing life. The hardened retaining shell of the bearing forms a reservoir for lubricant, holding plenty of grease or oil for long periods of operation, and the rotation of the rollers constantly supplies lubricant to the rotating shaft. When required by the application, the Needle Bearing can be readily adapted to gravity or pressure lubricating systems.

You can incorporate these advantages in your own product at very moderate cost. The simple design of the bearing makes possible a low unit price, and other economies result from the bearing's simplicity of installation. Because the Needle Bearing is built as a unit, it can be easily pressed into place in the housing—there are no loose parts to assemble. Moreover, the small size of the bearing often makes it possible to simplify the design of the housing, thereby saving space, weight, and cost in surrounding members.

The Torrington Engineering Department will be glad to work with you in adapting the advantages of the Needle Bearing to your products. For further information write for Catalog No. 10. For Needle Bearings to be used in heavier service, request Booklet 103X from our associate, the Bantam Bearings Corporation, South Bend, Ind.

The Torrington Company
ESTABLISHED 1866
Torrington, Conn., U.S.A.
Makers of Ball and Needle Bearings
Branch Offices in all Principal Cities

TORRINGTON
NEEDLE BEARING

Editorial

The Labor Board Investigation

■ A NUMBER of congressmen who favor revision of the Wagner labor relations act are reported as not inconsolably disappointed over the likelihood there will be no remedial action at this session. They feel congress is not yet minded to make changes as sweeping in character as needed, so that a better job can be done when the whole matter becomes better understood.

This better understanding may materialize before congress begins its next session, for the whole field of labor relations seems destined for a thorough scrutiny over the remainder of this year as a result of the house resolution, in response to "tremendous nationwide pressure", for a sweeping investigation of the national labor relations board. As a result of this resolution (STEEL, July 24, p. 19) a five-man committee has instructions to:

Thorough Probe of Board's Activities Forecast by Specific Instructions

Determine whether the board has been fair in its interpretations of the Wagner act and in its decisions; check the effects of the act on employer-employe relations and upon economic conditions; ascertain whether the board has "attempted to write into the act" purposes not justified by its language; suggest necessary amendments and determine whether congress should further define interstate commerce.

Judging from the temper of those who introduced and backed the resolution, and from the size of the majority vote which carried it, the committee can be expected to conduct its investigation without gloves and without pulling any punches. It is expected to give a real hearing to all companies and individuals who have suffered or believe that they have suffered injustices as a result of the administration of the Wagner act by the labor board.

The investigation comes at a time when the average citizen has become disgusted with labor leadership of certain types. This is shown clearly by recent poll votes and innumerable newspaper editorials, particularly those devoted to the recent WPA strikes and to the General Motors strike.

Sound Pattern for Industrial Relations May Follow Orgy of Union Misconduct

It comes at a time when political officeholders have cooled off notably in their attitude toward organized labor. Government has lost some of its fear of labor. The President declares nobody may strike against the government. The department of justice undertakes an investigation to determine the extent to which building costs have been increased as a result of alleged "slowdowns", levies against contractors, conspiracies and other racketeering tactics by building trades union leaders.

A good many things are wrong in this country. Various acts of government oppress business and make living conditions difficult for a large proportion of our citizens. The Wagner act is one of these. Sooner or later much remedial legislation will materialize, if we are to resume our traditional progress toward a higher plane of life. Establishment of a sound pattern for industrial relations would be a good beginning.

The BUSINESS TREND

Resistance to Seasonal Dullness Is Encouraging

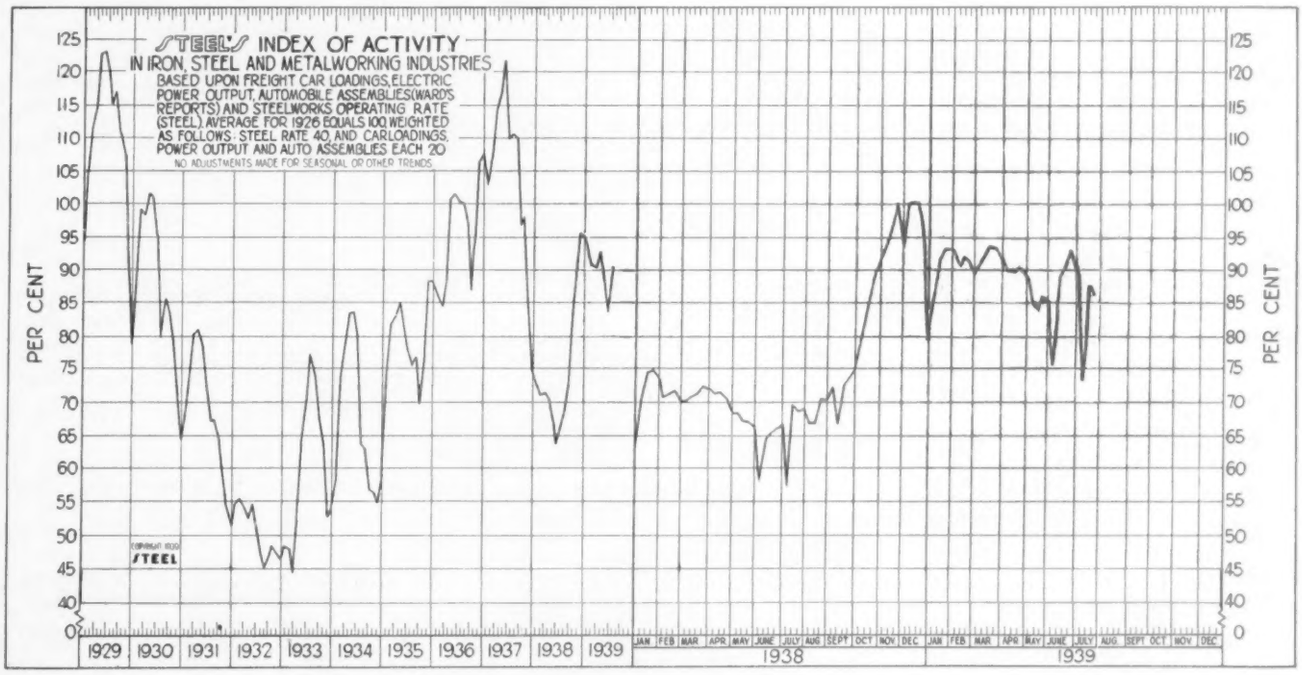
■ REFLECTING the sharp seasonal decline in automobile assemblies during the week ended July 22, STEEL'S index of activity in the iron, steel and metalworking industries eased 1.8 points to 86.0 from the 87.8 level recorded in the preceding week. For primarily the same reason the index declined 1.2 points to 68.7 in the comparable week last year.

An important factor in the current outlook is the encouraging contra-seasonal rise in steelmaking operations since the Fourth of July holiday week. In two weeks the national steel rate regained all the ground lost resulting from the holiday shutdown to equal the highest level this year of 56.5 per cent recorded in the weeks ended March 11 and 18. Still additional improvement in steelworks operations to approximately 60 per cent is expected in the week ended July 29.

Four more automobile producers concluded their 1939 model runs during the week ended July 22, bringing the total to 13. As a result automobile assemblies declined sharply to 47,420 units. This compares with 61,610 cars produced in the preceding week and 32,070 in the corresponding week last year.

Retail automobile sales this month are virtually certain to better the average seasonal performance. For the first 20 days of July it is estimated that sales were less than 4 per cent behind June and 48 per cent ahead of the like 1938 period.

The department of commerce reports that production


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL). AVERAGE FOR 1926 EQUALS 100. WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS.
PER CENT
125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 0
STEEL
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1938
1939

STEEL'S index of activity declined 1.8 points to 86.0 in the week ended July 22:

Week ending	1939	1938	Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
May 6.....	85.1	68.5	Jan.....	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
May 13.....	84.2	67.2	Feb.....	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
May 20.....	86.6	67.1	March.....	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
May 27.....	85.4	66.5	April.....	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
June 3.....	75.9	58.1	May.....	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June 10.....	88.2	64.4	June.....	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
June 17.....	90.9	65.2	July.....	....	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
June 24.....	93.0	66.0	Aug.....	....	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
July 1.....	91.0	66.5	Sept.....	....	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
July 8.....	73.4	57.1	Oct.....	....	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
July 15.....	87.8	69.9	Nov.....	....	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
July 22.....	86.0	68.7	Dec.....	....	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

of passenger cars and trucks in the United States and Canada during June totaled 324,235, compared with 313,214 in May and 189,399 in June, 1938. In the first six months this year output totaled 2,047,288 units, an increase of 56.7 per cent over 1,306,057 produced in the comparable period last year.

Revenue freight carloadings dipped to 656,341 in the week ended July 22, but remained well above the 580,882 cars loaded in the same week last year. Electric power output also declined in the week ended July 22 to 2,294,588,000 kilowatt-hours. Power consumption in that week compares with the peak this year of 2,324,181,000 kilowatt-hours recorded in the week ended July 15, but remains well above the 2,084,763,000 kilowatt-hours consumed in the comparable week last year.

Commercial failures declined seasonally during June to 952, with liabilities of $11,609,000, from 1122 disasters with $14,757,000 liabilities in May. The record of failures during June compares favorably with the corresponding month last year when 1073 firms failed for $15,918,000. In the first half this year 6563 bankruptcies were recorded by Dun & Bradstreet, which while 7 per cent less than the 7061 reported in the same 1938 period, is with this one exception the greatest number recorded in any half-year period since 1933 when 12,512 business casualties occurred. On a geographical basis failures in the eastern sections of the country during June showed the most favorable comparison with a year ago.

The foundry equipment and machine tool orders recorded a mixed trend during June, with the former recovering most of the ground lost during May while the latter receded from the peak this year touched in May. The Foundry Equipment Manufacturers association's index advanced 25.8 points during June to 134.6.

Business sentiment has improved somewhat in recent weeks, reflecting the ability of many industrial indicators to resist the normal seasonal influences and in some instances to record encouraging contra-seasonal gains. The rise in security values has imparted a new eagerness to business operations that may well provide the impetus for a continuance of expansion in general industrial activity.

Where Business Stands

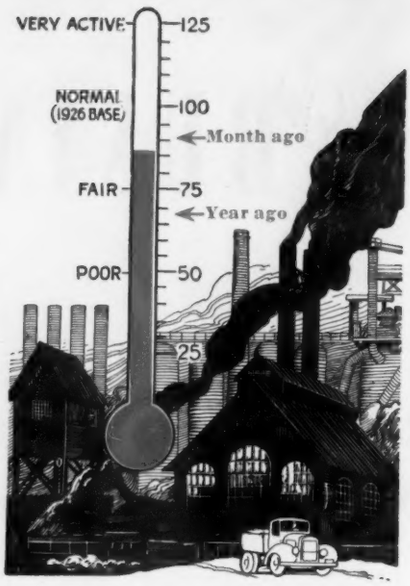
Monthly Averages, 1938 = 100

	June, 1939	May, 1939	June, 1938
Steel Ingot Output	133.2	119.5	69.7
Pig Iron Output	136.5	107.4	68.3
Freight Movement	108.2	102.5	96.2
Building Construction	108.2	112.0	94.2
Wholesale Prices	97.1	96.9	102.0
Automobile Production	146.5	141.5	85.6

Industrial Weather

TREND:

Upward



The Barometer of Business

Industrial Indicators

	June, 1939	May, 1939	June, 1938
Pig iron output (daily average, tons)	70,647	55,404	35,358
Machine tool orders index	211.6	219.8	70.2
3-months' moving ave.	195.7	186.9	75.7
Foundry equipment new order index	134.6	108.8	61.2
Finished steel shipments	733,433	723,165	478,057
Ingot output (daily average, tons)	120,399	108,069	63,010
Dodge building awards in 37 states (valuation)	$288,316,000	$308,487,000	$251,006,000
Automobile output	324,235	313,214	189,399
Coal output, (tons)	28,506,000	17,880,000	22,570,000
Business failures, number	952	1,122	1,073
Business failures: liabilities	$11,609,000	$14,757,000	$15,918,000
Nat'l Ind. Conf. board (25 industries, factory):†			
Av. wkly. hrs. per worker	36.5	36.8	32.7
Av. wkly. earnings	$26.19	$26.27	$23.38
Cement production, (bbls.)†	11,126,000	9,674,000	10,535,000
Cotton consumption (bales)	578,448	605,353	443,043
Car loadings (weekly av.)	620,797	587,935	551,970

†May, April and May, respectively.

Financial Indicators

	June, 1939	May, 1939	June, 1938
25 Industrial stocks	$173.12	$167.73	$153.92
25 Rail stocks	$20.79	$20.67	$17.49
40 Bonds	$71.72	$70.77	$66.64
Bank clear'gs (000 omitted)	†$22,188,000	$21,798,000	$20,169,000
Commercial paper rate, New York (per cent)	½—⅝	½—⅝	1
*Com'l. loans (000 omitted)	$8,089,000	$8,126,000	$8,321,000
Federal Reserve ratio (per cent)	85.6	85.4	82.4
Capital flotations (000 omitted)			
New capital	$292,576,000	$116,623,000	$348,765,000
Refunding	$311,804,000	$1,195,383,000	$164,367,000
Federal Gross debt (millions of dollars)	$40,440	$40,282	$36,167
Railroad earnings	†$25,100,765	$15,256,935	$16,496,701
Stock sales, New York stock exchange	11,967,710	12,932,710	24,364,130
Bond sales, par value	$126,656,525	$123,260,000	$144,464,300

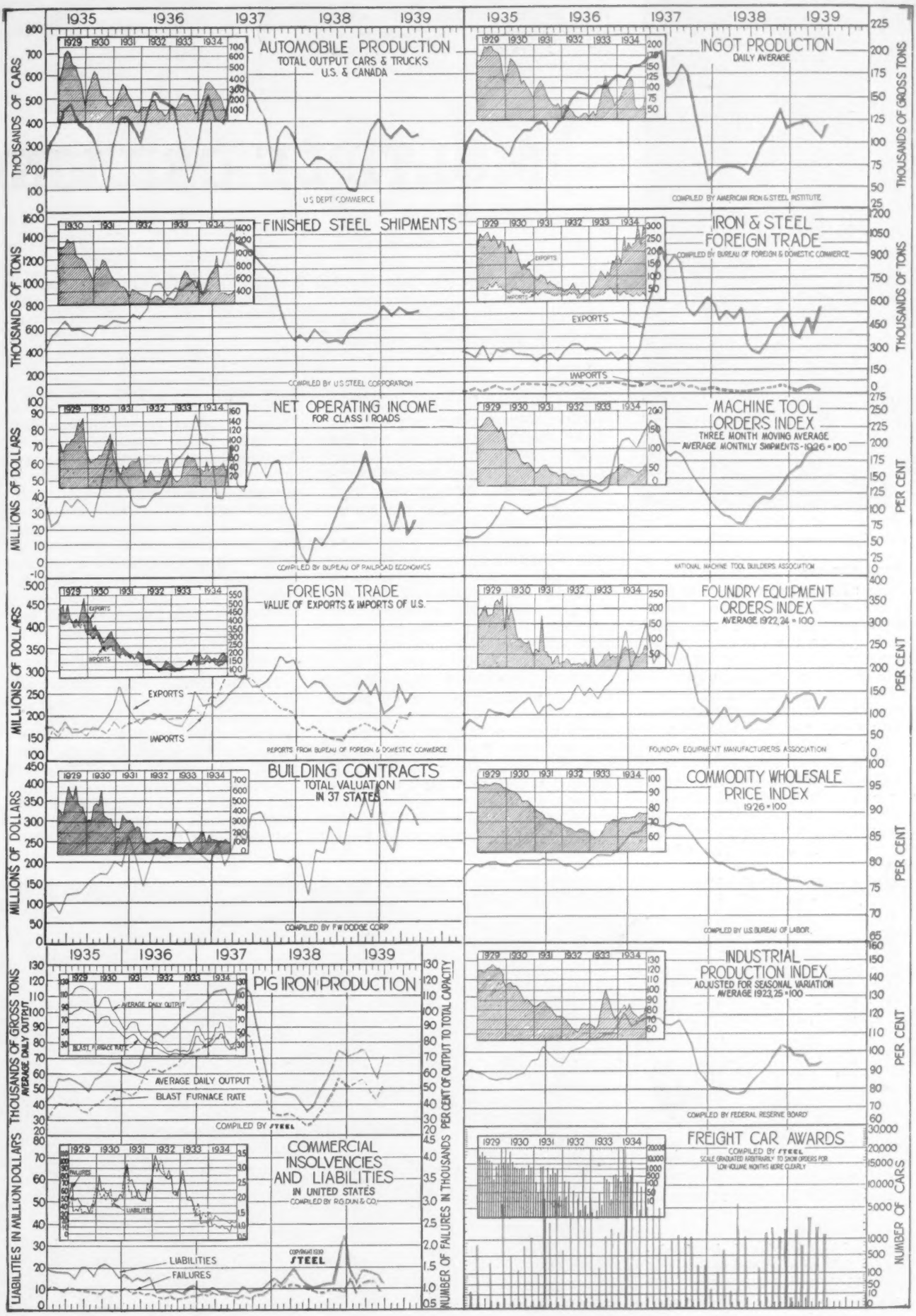
*Leading member banks Federal Reserve System.
†May, April and May respectively.

Foreign Trade

	May, 1939	April, 1939	May, 1938
Exports	$249,259,000	$230,948,000	$257,276,000
Imports	$202,502,000	$186,195,000	$148,248,000
Gold exports	$36,000	$231,000	$212,000
Gold imports	$429,440,000	$606,027,000	$52,987,000

Commodity Prices

	June, 1939	May, 1939	June, 1938
STEEL'S composite average of 25 iron and steel prices	$35.69	$35.80	$38.41
U. S. Bureau of Labor's index	76.3	76.5	80.2
Wheat, cash (bushel)	$0.90	$1.00	$0.91
Corn, cash (bushel)	$0.65	$0.66	$0.71


1935
1936
1937
1938
1939
1929 1930 1931 1932 1933 1934
AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS
U.S. & CANADA
THOUSANDS OF CARS
U.S. DEPT. COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
THOUSANDS OF GROSS TONS
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
THOUSANDS OF TONS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL
FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
MILLIONS OF DOLLARS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL
ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
PER CENT
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT
ORDERS INDEX
AVERAGE 1922,24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACTS
TOTAL VALUATION
IN 37 STATES
COMPILED BY F.W. DODGE CORP.
COMMODITY WHOLESALE
PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
PER CENT OF OUTPUT TO TOTAL CAPACITY
COMPILED BY STEEL
INDUSTRIAL
PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923,25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL
INSOLVENCIES
AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES IN MILLION DOLLARS
THOUSANDS OF GROSS TONS AVERAGE DAILY OUTPUT
NUMBER OF FAILURES IN THOUSANDS
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS

These special Foote Burt machines are semifinish reaming and finish reaming the valve guide and tappet holes in Studebaker Champion blocks

MULTIPLE DRILLING P

By **GUY HUBBARD**, Machine Tool Editor

■ ONE OF the outstanding contributions of American machine tool builders toward low cost interchangeable manufacture of automobiles has been the development of extremely fast and exceedingly accurate machines designed expressly for "the mass production of holes." Without the benefit of these distinctive types of multiple spindle machines for drilling, boring, reaming, tapping, etc., I venture to say that the cost of the average car in the medium price field today would be at least $100 more than it is—even though the latest machine tools were used on all other operations.

Let us consider cylinder blocks for example. The evolution of a typical automotive cylinder block over the past 25 years has been expressed in the following terse way: "It used to be a lot of iron with some holes in it, but now it is a lot of holes with a little iron around them." While improved foundry practice has contributed greatly to this evolution, the machining problems involved have at the same time been so many and so difficult that "hole engineering" has become a very important factor in the technique of production.

As a matter of fact, three groups have been deeply and co-operatively involved in solving these machining problems—the production engineers of the automobile industry, and the machine designers and the tooling engineers of the machine tool industry. None of these groups had much to go on in the beginning. While it is true that there had been multiple spindle drilling machines even in the early days of the machine tool industry, most of them were for small parts and most of them operated on a step-by-step principle—the work being passed from one spindle to another for successive operations.

Probably the oldest form of simultaneous multiple drilling on mass production was represented by relatively small machines for drilling and finishing the spoke holes in bicycle hubs. Those bicycle hub drilling machines were the immediate forerunners of some of the much larger and more intricate machines used in automobile plants.

To get a clearer conception of what the latest types of multiple spindle drilling, boring, reaming and tapping machines are doing to boost production, to improve quality, and to cut costs, it is only necessary to take a quick trip through any large automobile plant. Let us take for example, the Studebaker Corp., through whose courtesy we present herewith three interesting and significant multiple hole operations on 1939 Champion cylinder blocks.

Examples of Automotive Practice

The illustration which appears at the bottom of the left-hand page of this article shows in actual operation a multiple spindle machine developed for Studebaker by the National Automatic Tool Co. This accomplishes the simultaneous drilling of all holes in the top and manifold sides as well as the water circulating holes, in the Champion blocks.

Natco machine developed for Studebaker for drilling all holes in top and in manifold sides, as well as the water circulating holes—108 holes being dealt with simultaneously

PROBLEMS *Solved!*

Although the total number of holes dealt with at this one setup is 108, the machine has no difficulty in handling 60 blocks per hour.

The operation depicted at the top of the left hand page involves a battery of two special Foote Burt machines designed and tooled to semi-finish ream and then to finish ream the valve guide and tappet holes in the blocks. These two machines are typical of a number of other machines developed by the same company for Studebaker production. As in the case previously mentioned, normal capacity at this station in the production line is also 60 blocks per hour.

Let us now refer to the illustration reproduced at bottom of the right-hand page. Here we have a photograph of a special Greenlee two-way machine of angular type, which might well be called several machines in one. It is of four station type, has hydraulic feed, and provides automatic transfer of the blocks from station to station. It drills, bores and reams oil pump, distributor bores and all angular holes in both sides of the Champion blocks, keeping pace with the other machines in the line.

Possibilities in Other Industries

While the automobile industry has set a shining example of what can be accomplished with multiple drilling machines, their possibilities by no means are confined to that industry. Machines similar to those just discussed—but generally somewhat smaller and somewhat simpler in design—actually are being used to tremendous advantage in the manufacture of electric motors, washing machines, etc. Still simpler types, including those with quickly adjustable spindle clusters, are finding profitable applications on work which does not run into the big quantities just mentioned.

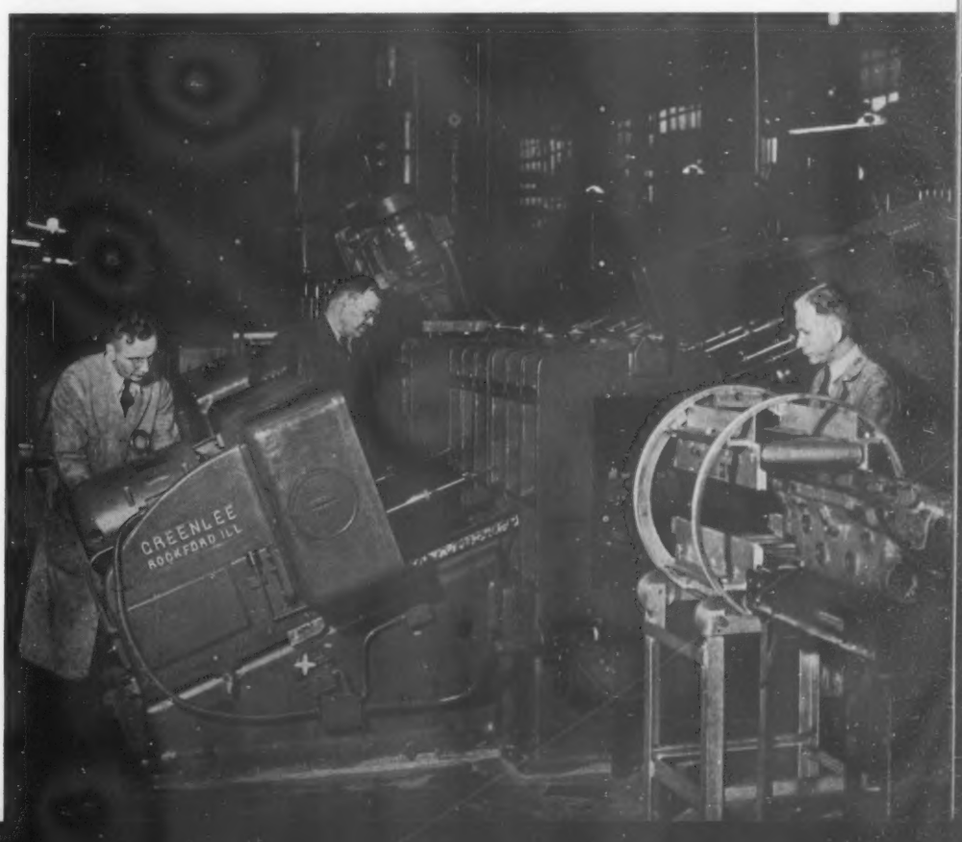
I had once supposed, as I presume many still do suppose, that a complicated multiple drilling machine of fixed center type—specially designed to handle a certain part—was pretty much of a total loss when a major model change affected the part which it was designed to drill, bore, ream or tap. While that may have been true to some degree a few years ago, that state of affairs lately has been changed very greatly through the ingenuity of our machine tool engineers.

Within the past few weeks I have been taken behind the scenes by several well known builders of highly specialized multiple drilling machines. They have taken pains to show me how they have improved the design and construction of these machines to the economic benefit of their customers. What these machine tool builders have done involves bookkeeping theory as well as engineering. Its success is due largely to skillful application of unit system of construction.

Take for example a simple way-drilling machine in which two sets of spindles operate on opposite sides of the work. The bed will consist of three sections, two being of standard design on which the spindle units are mounted, while the central section on which the work is held is designed to suit the particular characteristics of the part to be machined. In some cases this special central section is fabricated by welding. The heads are made up as far as possible of standard parts, their principal special characteristics being in spindle spacing.

Now in the event of a major model change, the central section of the bed is scrapped (if it cannot be rebuilt, as often it can) and the heads are rebuilt to provide for any new spindle spacing required—all this at nowhere near the cost of a new machine.

When such a machine is sold, its maker recommends that its cost be divided between the capital or "fixed equipment" account and the tool or "expendable material" account; the standard bed sections, head casings, spindles, etc. to the former, and the central bed section, the spindle spacing plates, etc., to the latter. Thus the true cost of the machine is kept in the correct perspective, the paperwork involved in its rebuilding is simplified and the cost of such rebuilding is charged against the appropriation to which it properly belongs.



Four-station Greenlee (at right) drills, bores and reams oil pump and distributor bores and all angular holes on both sides of the Champion blocks—automatic transfer being provided

METAL

Spraying of chromium steels greatly expands application of the metal spray gun as these steels produce hard, corrosion-resistant surfaces. Rebuilding worn parts produces savings of 50 per cent or more with added life

■ AT PRESENT there is a marked trend toward use of high carbon, straight chromium, rustless steels when building up worn machine elements by application of metal spraying.

Items successfully built up by metal spraying chromium steels include parts made of such materials as low carbon steel, cast iron, brass, bronze and other metals. The advantages to be gained by having any of these materials built up with a hard, corrosion-resistant wearing surface are obvious.

Ever since the development of mechanical devices, the problem of how to prolong their useful life has been of major importance. While engineers, metallurgists and researchers have co-operated to produce better metals and alloys, resulting in machines of greatly improved serviceability, the increased severity of service and heavy demands placed upon present-day equipment partially counterbalance these developments so deterioration of metal parts by wear, corrosion and erosion is still with us.

Until comparatively recent years, deterioration usually required a complete replacement of the worn part. However, due to improvements in this Metalspray process and tools this now can be avoided in many instances. Building up of such parts by application of corrosion resistant steels not only furnishes a satisfactory repair, but aids in counteracting the conditions which cause the original deterioration. In maintenance of wearing and bearing surfaces of shafts, pump rods, sleeves, plungers and the like, savings up to 50 per cent or more are being realized.

In application of metal spraying, it should be remembered that while compressive strength of sprayed metal is comparable to cast metal of similar analysis, its tensile strength is greatly reduced. Sprayed metal also has a more open or porous structure under the microscope. While ductility is good, it is not as high as that of rolled material.

Also, the bonding with the base metal must be considered as this is a purely mechanical procedure and requires careful attention. Any method of roughening and undercutting the surface sufficiently is suitable, using a lathe tool on machinable parts and sandblast or steelgrit blasting on flat surfaces. The minute cavities and undercuts thus produced will aid in holding the sprayed metal. Cleanliness of the prepared surface is highly important. Moisture, oily films and oxidation must be avoided.

These characteristics merely emphasize the importance of adequate preparation of the surface before metal spraying.

While many manufacturing establishments are equipping their shops to handle metal spraying work, others use facilities of local contract shops. Several "Metalspray" jobs completed by F. G. Walter Co., San Bernardino, Calif., are typical of work being done by such shops.

Fig. 1 shows a cast iron water pump plunger, 14.5 inches in diameter and 9 feet long. This part, as well as two pistons metal sprayed at the same time, were taken from a unit pumping irrigation water carrying some sand. This sand imbedded itself in the packing and greatly accelerated wear on the relatively soft cast iron surfaces. Rust which formed during off-season idleness of the unit also was destructive.

Sprayed with Stainless Steel

To overcome the above mentioned disadvantages, engineers of the pumping plant decided upon a Metalspray application of a hard, rustless steel as the best means of repairing these parts. It was thought impractical to try restoring the pistons by welding because of the possibility of cracking. Replacement by sleeving would have involved a greater cost. When sprayed with stainless steel, the actual service obtained from the parts would be equal to that from solid stainless steel, so metal spraying was considered highly advantageous on this application.

Four 3.5-inch diameter piston rods 10 feet long from the same pump were resurfaced with stainless steel. Spraying of one of these rods is

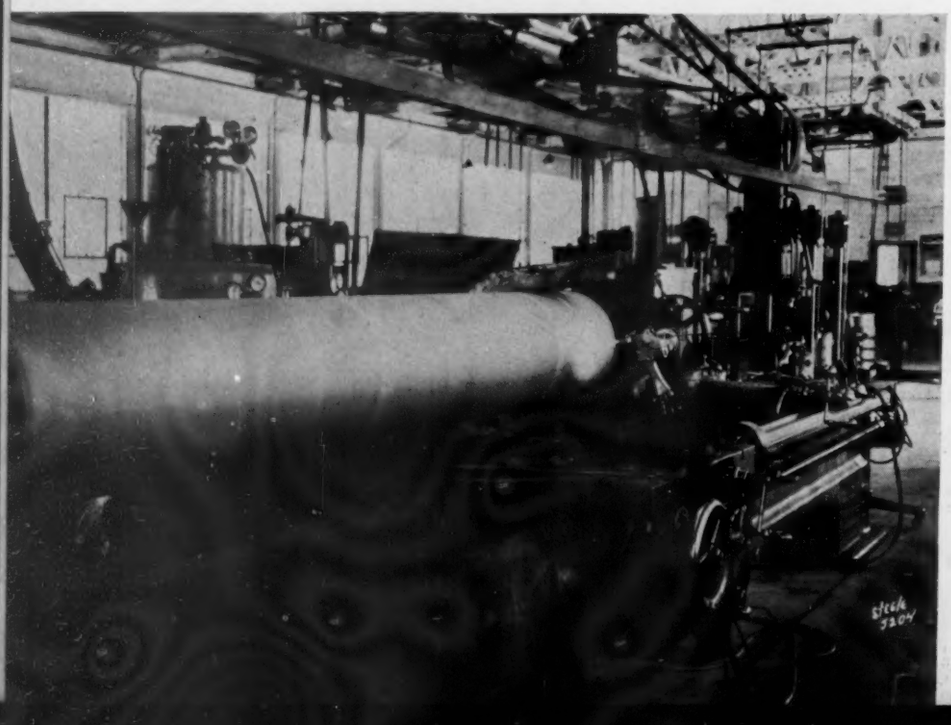


Fig. 1—Cast iron plunger, 14.5 inches in diameter and 9 feet long, being rebuilt by metal spraying. It is part of irrigation pump carrying much sand resulting in bad erosion

SPRAYING

With Rustless Chromium Steel

By P. LEDER
Metalspray Co. Inc.
Los Angeles

shown in Fig. 2. Here the Metalspray gun is on the tool rest.

Procedure followed in application of air-hardening stainless steels is essentially the same as that employed for any other steel or metal. Preparation for spraying consists of mounting the part in a lathe, turning the worn and pitted surface to a uniform diameter, and then machining a rough, full-depth 20-pitch thread into the areas to be built up.

The parts were revolved at a speed of about 50 lineal feet per minute. Lathe feed was set to advance the gun 1/20-inch per revolution. Rate of deposition of the metal was 8 pounds per hour. Parts were built up to the required size by several successive passes of the gun over the surface. A diametral allowance of only 0.030-inch was necessary for finishing to size.

Finished by Grinding

The air-hardening ability of the high carbon (0.3 per cent carbon) chromium steels has already been mentioned. The air quench and rapid cooling of the molten steel as it is deposited produced a hardness of approximately 400 Brinell in this application. Thus, as in this case, it usually is necessary to finish the parts by grinding.

In most instances, wet grinding is preferable to dry grinding from the standpoint of accuracy and quality of finish obtained. Use of a coolant in grinding also eliminates any possibility of overheating the deposited surface. However, dry grinding will give a satisfactory finish for many applications.

Rebuilding parts with stainless steel also proved valuable in another instance where a set of three cast iron plungers operated in a large multiple-type pump, handling hot soap. Life of both original and replacement plungers had been short because of the corrosive properties of the liquid soap. One set of plungers was metal sprayed using chromium steel to deposit a hard, rustless surface. After three years of almost continuous service, recent inspection showed the part to be in "good as new" condition with no apparent effects from either wear or corrosion.

Results obtained in service from many metal sprayed parts indicate that high-carbon, plain chromium, rustless steel is superior in its wear resistance to simple carbon steel of the same sprayed hardness. This improvement can reasonably be credited to the chromium content of the steel. Because of the extremely hard surface produced, the field of usefulness of such metal sprayed parts using high carbon chromium steel deposits can economically be extended to include other applications where maximum resistance to wear is required even though corrosion is not an important factor.

Recipients of revolving machine parts such as bronze bearing boxes, cylinders, sleeves, bushings, etc. can be rebuilt to advantage also, and easily restored to original size or to an oversize by adding a metal of superior quality by metal spraying. Pump sleeves weighing several hundred pounds have been reconditioned in this manner for less than half the cost of a replacement casting and they gave longer service than the original.

Higher Saving on Larger Parts

Naturally reconditioning of heavy machine parts always effects a comparatively higher saving than small machine parts. On many babbit bearings, even up to 18 inches in diameter, the worn babbit has been replaced successfully by spraying. Bearings of rock crushers, ore mills, cement kilns and other heavy machinery have been reconditioned by this method at a fraction of the cost of replacing or rebabbitting.

Apparently there is no limit to the uses of the metal spray process as constantly new ideas are being conceived to reduce maintenance costs with its help.

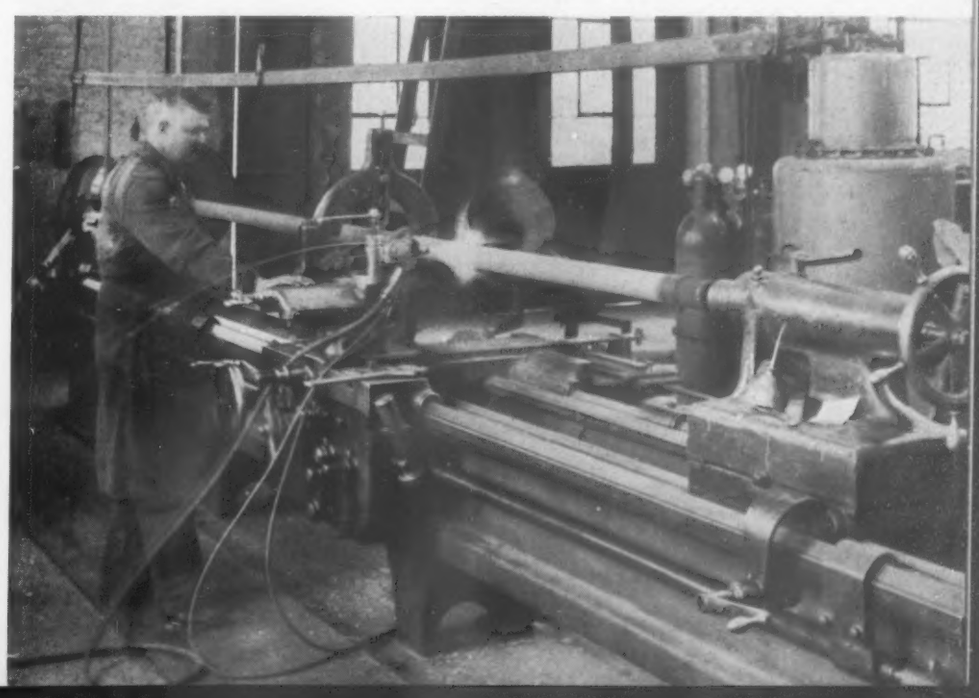
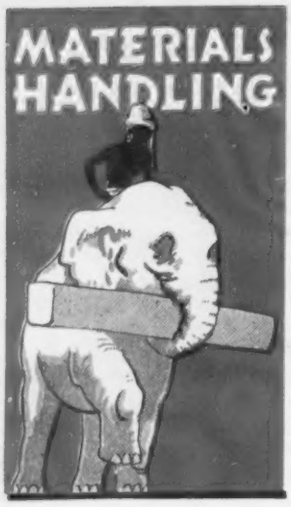


Fig. 2—Here piston rods, 3.5 inches in diameter and 10 feet long, are being resurfaced with stainless steel by the metal spray gun



Speeds Coal Handling

Large Brooklyn yard installs light traveling bridge equipped with rope-operated man trolley. Auxiliary boom almost doubles effective span. With cab mounted over bucket hoist, operator can control all movements efficiently and safely

■ NEW EQUIPMENT which has greatly simplified the handling of coal, reducing the number of times it is moved from three or perhaps six down to only one or two, with a resultant decrease in degradation, was installed recently in the coal yard of the Kokancoal Co., Inc., Brooklyn, N. Y. Principal unit of this equipment is a light and relatively inexpensive traveling bridge featuring what is said to be the first rope-operated man trolley.

The bridge, shown in the accompanying illustrations, is 75 feet high and has a span of 180 feet, and is provided with an auxiliary boom trolley that can be extended 90 feet over the shear leg on the water side and 60 feet over the pier leg on the land side. Thus, coal can be picked up or deposited at any location with a total span of 330 feet. Equipment is electrically operated over tracks which extend for a length of 600 feet. On the water side the rails are set back a maximum of 32 feet from the bulkhead because of a curve on that line.

Trolley on Auxiliary Boom

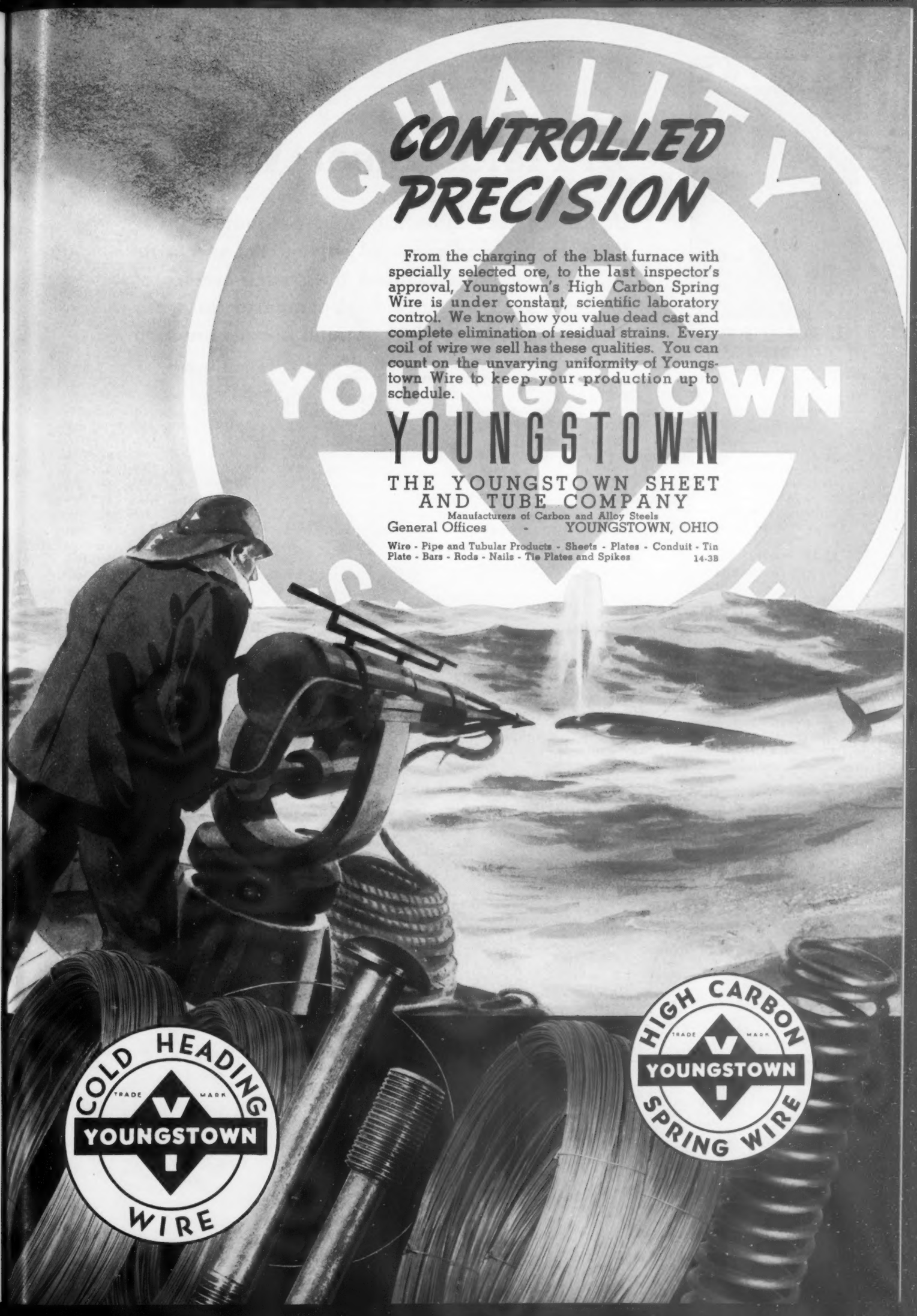
The bucket trolley, which also supports the operator's cab, is carried on the auxiliary boom trolley. Bucket hoist and trolley travel drive are mounted on the span, design permitting simultaneous travel of the boom and cab and bucket, with independent hoisting or lowering of the bucket as required. The operator's cab always is directly above the bucket, an arrangement which is important for safety as well as efficient operation. A signalman is not required.

Capacity of the bucket is 2½ tons; in the free-digging of coal from ship to hopper, 150 tons an hour can be handled. When coal is handled from ship to the average storage pile or from the average pile to hopper, the hourly rate is as high as 200 tons. The boom is retracted when it is not in use, thus does not extend over the water.

Speeds of up to 300 feet per min-

(*Please turn to Page* 56)

Up to 200 tons of coal per hour can be handled with this light traveling bridge recently installed in a Brooklyn, N. Y., coal yard. In the upper illustration, the bridge has its auxiliary boom extended over a boat and the bucket is being lowered into the hold. The operator has a clear view, his cab being located directly over the bucket. The aerial view of the coal yard and bridge (bottom) shows the hoppers on the land side of loading trucks. Aerial view by Fairchild Aerial Surveys, Inc., New York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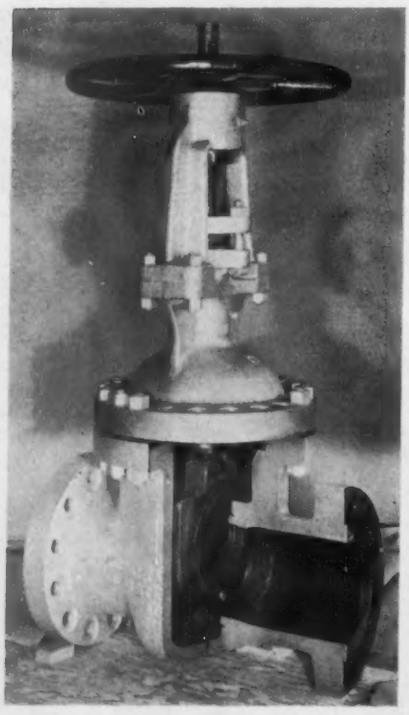
Bi-Metal Steel Valves

Use of correct materials and procedure gives long life to hard-surfaced valve disks and seats called upon to withstand the severe service of modern high-pressure high-temperature work at pressures up to 4000 pounds per square inch

By E. R. SEABLOOM
Research Engineer
Crane Co.
Chicago

■ THE EVER-INCREASING operating pressures and temperatures imposed upon materials that enter into valve construction emphasize the severe service conditions under which such equipment must operate. Already steam pressures have risen from 100 pounds per square inch at 338 degrees Fahr. to 1500 pounds per square inch at 950 degrees Fahr. In the oil industry, cracking stills now operate at pressures of 3000 pounds per square inch and temperatures of 1200 degrees Fahr., and designs of equipment and materials for 2500 and 4000-pound standards are now being worked upon intensively. Such service brings increasingly serious problems to the valve manufacturer.

Fig. 1—Carbon molybdenum cast steel gate valve with deposited seating surfaces



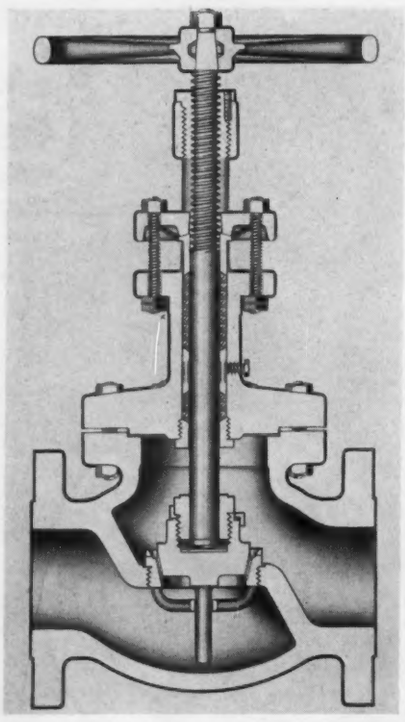
Bodies and bonnets of valves have undergone numerous changes in materials during this period of advancement and are now being made of alloys. Internal parts also have been changed, especially the seats and disks which are subjected to the most severe abuse. These latter were first made from bronzes, then in improved materials or combinations of materials such as monel metal, cast nickel-copper-tin alloys, alloy steel, nitrided steels, stainless irons and finally the present ultimate of deposited surfacing alloys. Deposited surfaces on disks and seats of all valves used on steam temperatures above 750 degrees Fahr. are standard practice of Crane Co. The bulk of these are gate and globe types, these two basic designs being discussed here.

Seating Surfaces Are Alloy Material

A gate valve for high-temperature service, Fig. 1, has a sliding wedge gate or disk which seats against body rings, mounted in the valve body, when closed by means of a threaded stem to form a pressure-tight connection. Seating surfaces of the disk and body rings are of deposited alloy material, the base metal of these parts being of an analysis suitable for the particular service requirements. Body rings may be screwed, screwed and brazed, or welded into the valve body where size permits. Brazed or welded-in body rings are desirable on high-temperature service to overcome loosening of body rings in service from expansion and contraction differences between rings and body.

A typical globe valve, Fig. 2, has a cylinder tapered plug disk with a screwed-in, a screwed-in and seal-brazed, or a welded-in seat ring on the larger sizes. Seating surfaces of disk and seat ring are of deposited alloy material, particularly on valves for high-temperature service. On smaller sizes of steel globe valves, the seating material sometimes is

Fig. 2—Cross-sectional view of steel globe valve showing deposited seating surfaces



Abstract from paper presented at last annual meeting of American Welding society.

deposited directly onto the body seat bore, thereby eliminating the seat ring. Whereas gate valves are used primarily for shutting off and starting flow of fluid and so are either fully closed or open, globe valves see extensive service in throttling or controlling flow in a partly opened position.

Selection of seating materials is most important. They must possess high resistance to erosion, abrasion and corrosion, withstand heavy loading without galling or seizing under high temperatures, and offer a fair degree of machinability. When deposited, the material should flow out smoothly to minimize amount applied and reduce quantity to be removed during machining or grinding.

Seating material must have high resistance to erosion due to the greatly increased velocity of fluid flowing through them when partially closed, causing serious erosive action. To facilitate testing materials for resistance to "wire drawing," as such erosive action is known, a special test set-up was made, using steam nozzles so arranged that a high velocity jet of steam impinges upon the test specimen and spreads out radially at high velocity through a restricted area.

Depth of Erosion Varies

As revealed in photographs, Fig. 3, showing results obtained by a 100-hour test on 350-pound saturated steam pressure, the depth of erosion varies greatly and furnishes a means of classifying the materials for their erosion resistance. These investigations indicate that hardness is not an index of a metal's resistance to erosion as stainless irons and steels, while not particularly hard, display excellent resistance to erosion. In the case of deposited surface hardening materials, alloys of the cobalt-chromium-tungsten class give superior results over cemented tungsten carbides or borides suspended in ferrous matrix even though there is a tremendous difference in hardness values.

Another important factor entering into selection of materials for seating valves with sliding disks is that they retain bearing properties and high hardness at elevated temperatures to prevent seizing or galling when operated under heavy loads. Pressure loads in excess of 20,000 pounds per square inch often exist, and improper materials gall rapidly. In one instance a gate valve disk galled badly when operated only twice under test conditions of 350 pounds saturated steam. Seating material in this case was 12 per cent chromium iron, outstanding for erosion resistance but unsuitable as surfacing material when used against a material of similar characteristics on steam service. With a dissimilar metal, results are much improved.

Metal Seizure Studied

To study seizure of metals, a special test set-up was made to measure this factor accurately. Materials showing favorably here are further tested in an actual valve on an automatically opening and closing mechanism blowing steam to atmosphere, thus imposing heavy loads on the seating surfaces.

A third factor is resistance to abrasion as the seats must withstand scoring or indentation by scale and other hard foreign particles conveyed with the fluid. This characteristic is based primarily on hardness of material.

Final selection of material for valve seats is usually a compromise as no particular alloy appears outstandingly superior in all desirable properties. Thus materials are chosen to give the best service for the particular application on which the valve is to be used.

Cobalt-chromium-tungsten alloy is widely employed as it displays excellent resistance to wear, seizure and abrasion at high temperatures. Also it maintains its hardness well up into the red-hot range. It withstands certain types of corrosion remarkably well and is fairly resistant to erosion.

Usual practice is to deposit this particular type of alloy manually with the oxyacetylene torch. This produces a smooth deposit, gives good control in prevention of interalloying with surface material and involves no intricate procedure. Fig. 5 shows surfacing both small and large valve parts. Smaller disks and seats are mounted in rotating jaws or chucks which can be revolved at will by the operator through a foot-controlled motor-driven gear reducer.

Preheating is done to avoid cracking of surfacing material. On small parts, this is accomplished by the

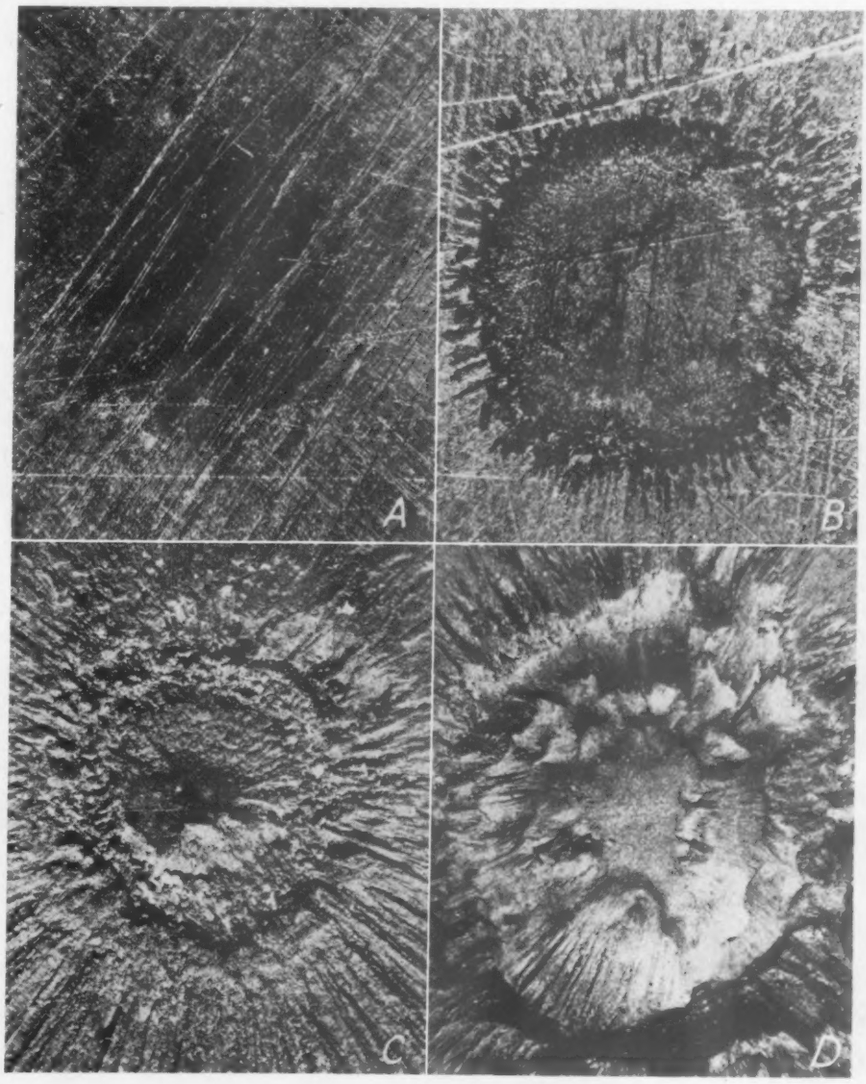
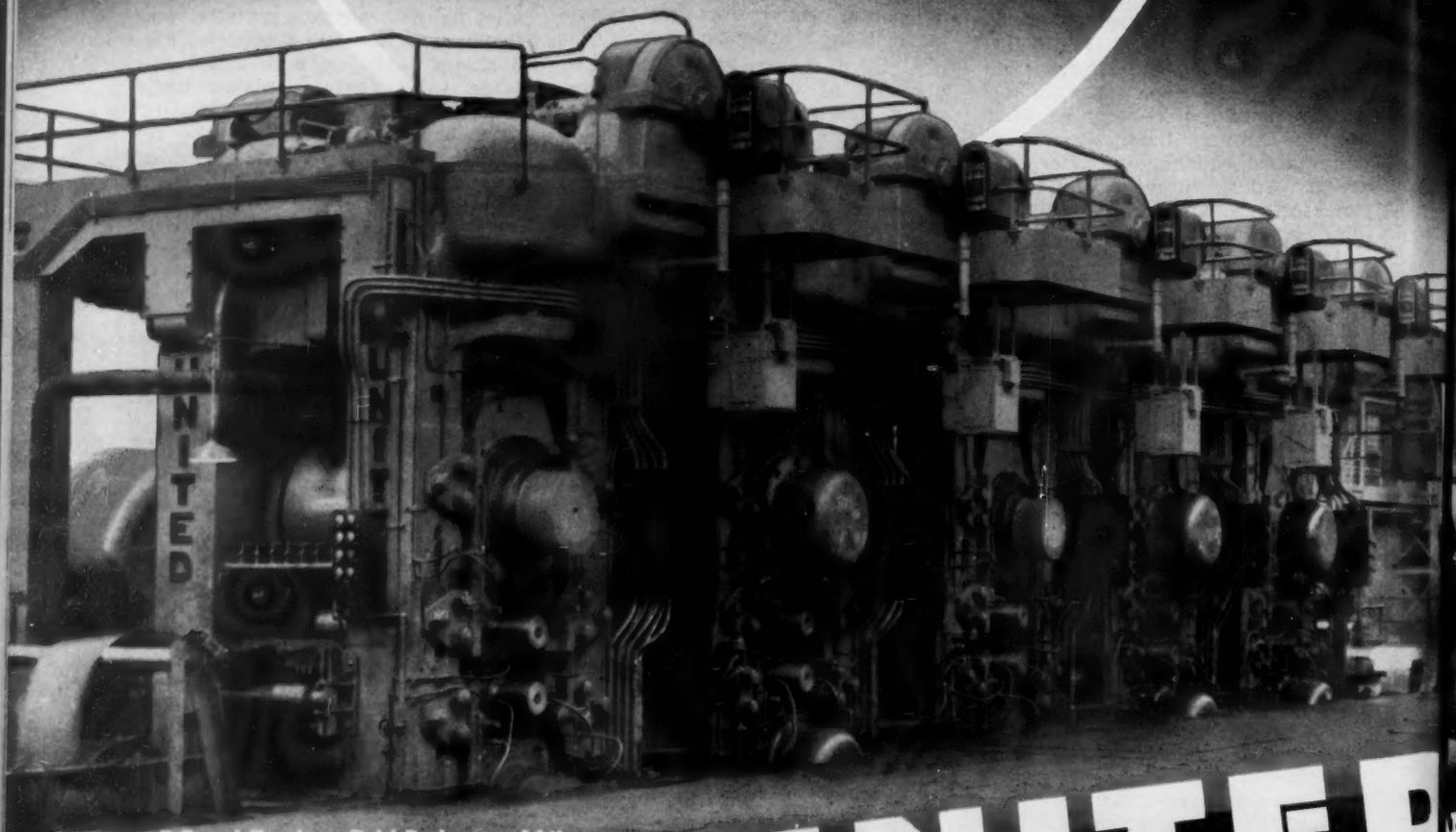


Fig. 3—Typical test results on various materials subjected to steam erosion: A, 12 per cent chromium iron; B, cobalt-chromium-tungsten alloy; C, nitrided steel; D, cemented tungsten carbide

RICHARD THOMAS COMPANY · LTD.

Ebbw Vale, Mon., Great Britain

MILLS



5-Stand Tandem Cold Reduction Mill

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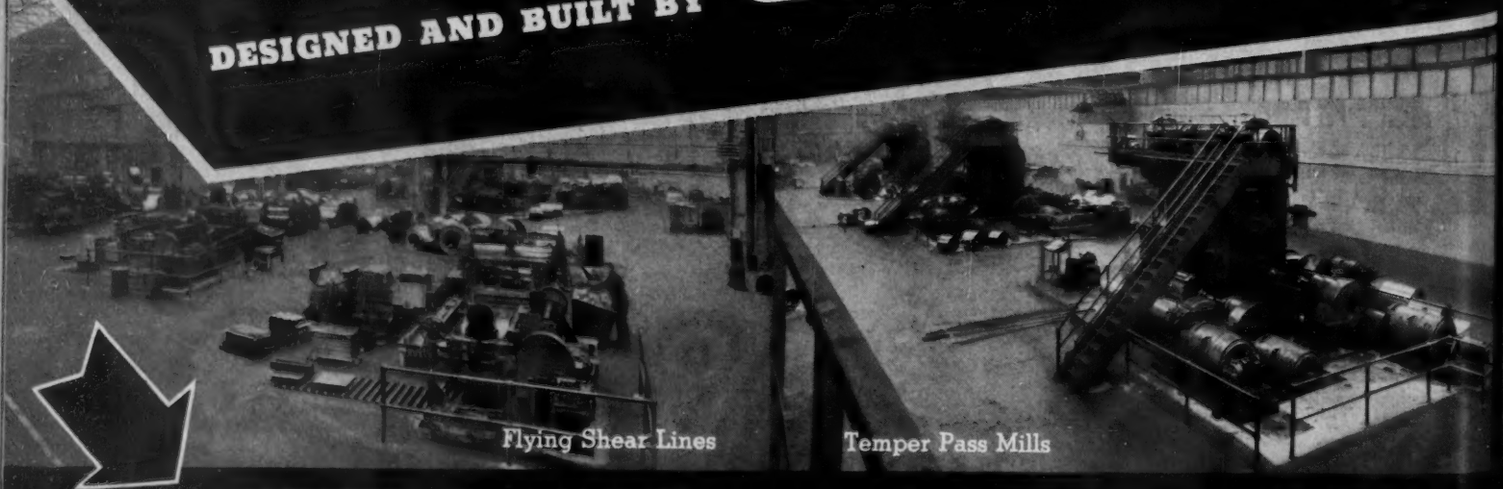

Flying Shear Lines

Temper Pass Mills

UNITED ENGINEERING and FOUNDRY COMPANY

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oxyacetylene flame prior to deposition of the alloy. Small and intermediate parts with relatively heavy cross sections are preheated in gas-fired furnaces and placed in the rotating machines for depositing the surfacing material.

Large parts and those made from certain types of alloy necessitate maintaining the preheating temperature uniformly during the deposition. Specially constructed furnaces permit simultaneously preheating and depositing the seating material. The two operators in the foreground of Fig. 5 are working on such furnaces.

Procedure for surfacing consists of bringing a small area of the preheated base metal to a sweating temperature, after which the welding rod is brought into the carburizing type of flame and allowed to melt and spread over the sweating surface. This operation is repeated continually by adding metal and the molten surface is spread with the flame. This is the same procedure as employed in much other surfacing work.

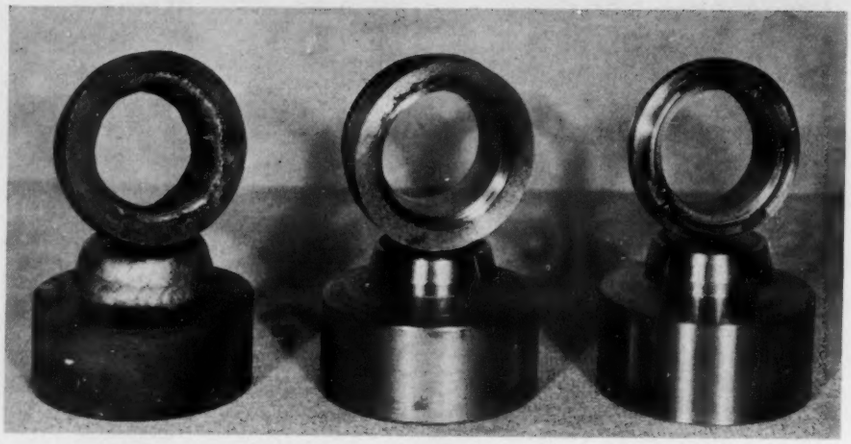


Fig. 4—Stages of preparation of globe valve disks and seat rings. Left to right, after surface depositing, rough machining, and final grind

Practice at Crane Co. is to employ two or more passes as a smoother deposit, free from blowholes, is obtained and overheating of base metal is minimized, reducing grain growth and making it unnecessary to heat treat after depositing most of the simple alloy steels. Photomicrographs indicate there is practically no alloying between base metal and surfacing material.

Since treatment after depositing plays an important part in preventing cracks in the deposited material, the deposited material and base metal adjacent to it are reheated to a uniform temperature and the part placed in a container with powdered lime. Thickness of lime is sufficient to give an extremely slow rate of cooling. Parts are left in the lime from 12 to 60 hours, depending upon size and shape. After cooling, parts are sandblasted to remove all scale and to present clean surfaces for easy detection of cracks. Cracked deposits are resurfaced completely as localized heating only causes further cracking.

Parts Machined Before Coating

Parts to receive surfacing material first are machined to predetermined dimensions with proper tolerances and allowances for shrinkage so finished deposited metal is from 1/16 to 3/32-inch in thickness, depending upon size and design. Deposits are generally applied to a depth twice these thicknesses to prevent surface irregularities from interfering with the finishing operations. Final finishing of the deposit metal usually is divided into several operations. According to type of disk, body ring or valve body, parts are rough machined using tungsten carbide tools or rough ground prior to the finish grind.

(*Please turn to Page 57*)

Fig. 5. (Upper)—Group of welding operators depositing surface hardening material on valve parts. Fig. 6. (Lower)—Checking taper and trueness of deposited seats on valve disks

A Compact Plant

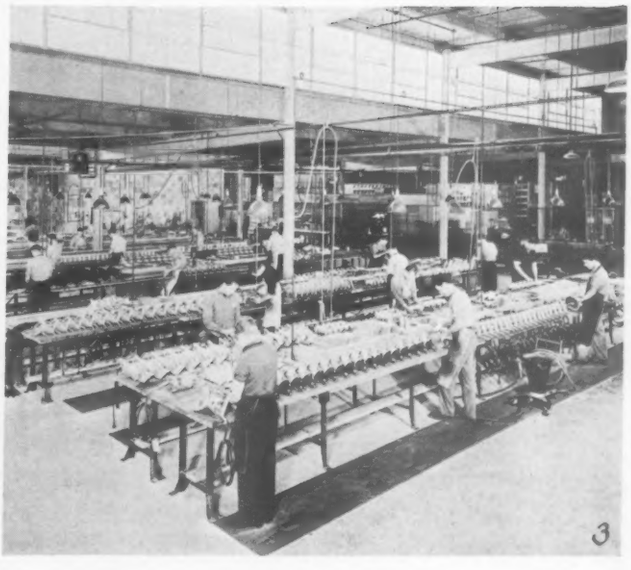
1

■ WHILE new factory and offices of Skilsaw, Inc., Chicago, represent a 250 per cent increase over space previously occupied, production capacity was increased more than 400 per cent due to departmentalization of production, storage and handling facilities in an efficient, logical layout. Designed and built by Austin Co., Cleveland, 2-story office extends across most of the 140-foot landscaped facade and plant proper has overall depth of 200 feet with an additional 300 feet available for expansion. Four 30-foot and one 20-foot aisles are provided. Continuous sash at rear wall aid tool and machine operations, Fig. 2. Overhead-bus distribution system permits running electric conduit overhead direct to each operating unit.

Assembly benches, Fig. 3, are laid out parallel to the monitors for even distribution of daylight. Permanent rubber floor mats increase worker's comfort. Testing, inspection and packaging are done along partition wall at right angles to the 12 assembly benches so completed tools can be passed along for final checking and wrapping with no waste motion. Although daylight pours into the drafting room, Fig. 4, skylight type electric fixtures are used over each board.

With 70 per cent increase in business during the first quarter of 1939, an addition already is authorized.

2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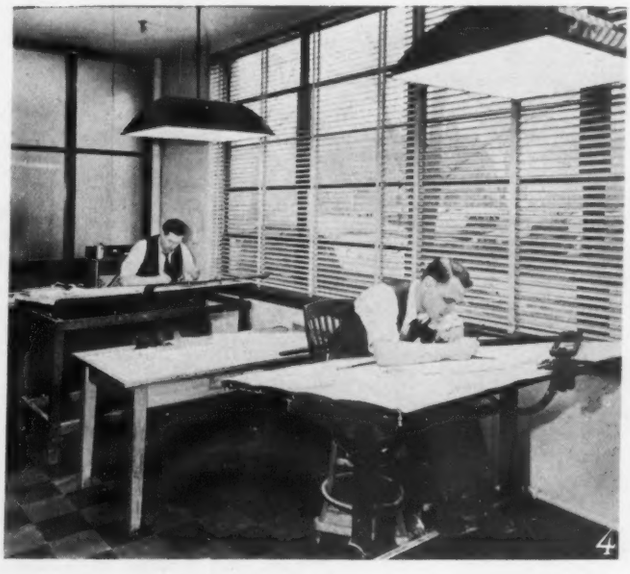

4

PROGRESS IN

STEELMAKING

Aiding Small Furnaces

Use of clay spheres in stoves gives 6 per cent increase in heating surface and 28 per cent more brick mass, permits increasing blast temperatures from 1100 to 1500 degrees Fahr. Rearrangement of hot blast lines also is of benefit

By G. B. GARRETT
Arthur G. McKee & Co.
Cleveland

■ SMALL ISOLATED blast-furnace plants may not offer all the opportunities for improvements in operating economies that large furnace plants closely integrated with steel works do. At the same time, there are a number of things that can be done to obtain better economies in operation.

Possibly some of the most important savings which can be capitalized to justify refinements in blast furnace equipment are those which result from decreased fuel consumption and increased furnace capacity. Coke consumption has been found affected by many details of furnace operation. It is commonly agreed that substantial savings in coke can be had by increasing the blast temperature. A rather rough rule of thumb indicates that a saving of 30 pounds of coke per ton of iron accompanies each 100-degree Fahr. increase in blast temperature.

An interesting example of modernizing a small blast furnace plant is seen at the Norton furnace of American Rolling Mill Co., Ashland, Ky. Originally constructed in 1872, many additions and enlargements have been made without rearrangement of equipment to keep a simple and workable layout.

The stoves, five in number, had been allowed to encroach on the furnace, which was crowded by No. 1 stove when enlarged. Referring to the diagram, Fig. 1, the three original stoves will be seen in line but too close to the existing furnace. A fourth stove had been added on the other side of the hot blast main opposite the space between No. 2 and No. 3 stoves. Also, a fifth stove had been placed at the end of the original stove line.

These additions had been made without renewing the hot blast valve connections and an awkward main, resulting in poor hot blast main system. Locations of major items of equipment before rebuilding are shown in light lines in Fig. 1 with heavy lines showing the plant after modernizing. To take advantage of economies possible by increasing blast temperature as mentioned above, it was desirable to rearrange the system to permit using blast temperature of 1500 degrees Fahr. instead of 1100 degrees Fahr.

Insufficient Heat Storing Capacity

The four original stoves were 18 x 77 feet, side combustion, having 270 flues 5¼-inches square and approximately 57 feet long. Surface available for heat transfer was 30,000 square feet when the stoves were clean. Brick mass available for heat storage was 623,000 pounds. This type of stove, while suitable for dirty gas and blast temperatures averaging 1100 degrees Fahr., is not capable of storing and transferring the heat necessary to maintain 30,000 cubic feet per minute of air at 1500 degrees Fahr. for one hour.

To increase heating surface and brick mass, 3½-inch fire clay

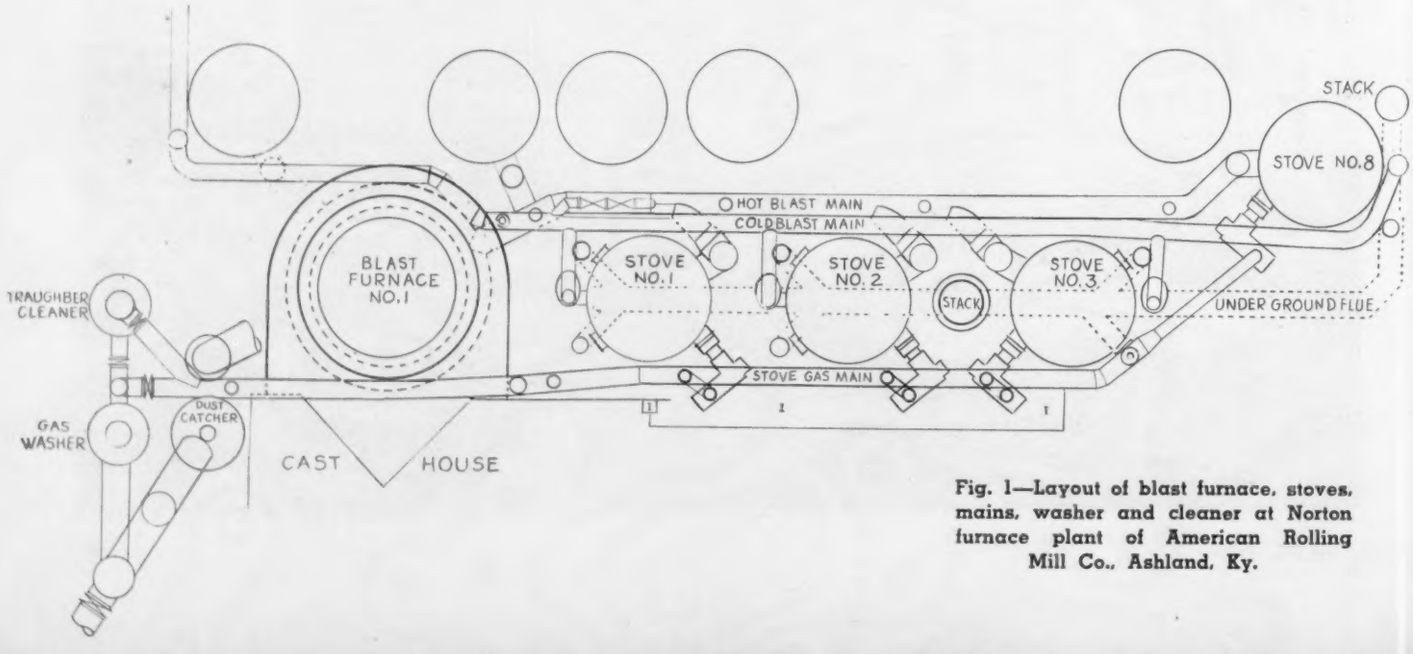
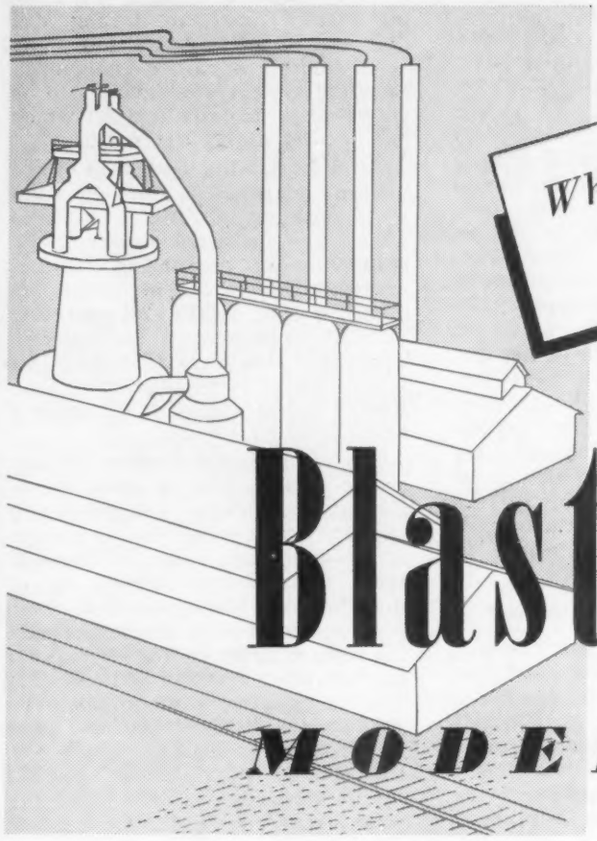


Fig. 1—Layout of blast furnace, stoves, mains, washer and cleaner at Norton furnace plant of American Rolling Mill Co., Ashland, Ky.



What is the return on YOUR investment?

Blast Furnace MODERNIZATION

WE have recently completed extensive remodeling of two small blast furnace plants. Built many years ago, changes necessary to secure an efficient layout presented a difficult problem. In addition much of the old equipment had to be used. Total expenditure was a limiting factor and return on investment a primary motive. Due to the years of experience of our organization with similar problems we were able to evolve a very successful solution. These plants are now in operation with costs that compare favorably with many larger units.

The primary object of any proposed modernization program is return on investment. In the case described above this is being achieved. To accomplish this requires skill and experience in planning the program. Whether it is a question of building a new 1000 ton blast furnace plant or remodeling an existing one, large or small, your problem will receive the same careful attention of our entire organization from the period of initial planning until construction work is completed and all units placed in successful operation.

Undivided responsibility in one organization as exemplified by McKee is responsible for the long list of satisfied customers who have turned to us for the solution of their blast furnace design and construction programs. There is also an assurance, from an engineering and economic standpoint, that your modernization program will be sound.

With complete engineering and construction facilities we offer the following services:

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spheres were placed in the square flues. This can easily be accomplished in most large checker stoves as a suitable bottom support usually can be developed.

Using 3½-inch spheres in a 5¼-inch flue maintains 65 per cent of the original free area and increases heating surface 66 per cent with a 28 per cent increase in brick mass accomplished. This gives these stoves 50,000 square feet of heating surface and 798,000 pounds of brick.

Three stoves of the characteristics listed above have proved to be sufficient to maintain a straight line blast temperature of 1500 degrees Fahr. with a maximum stack temperature of 600 degrees Fahr. However, one spare stove as originally lined was left in the system to take care of emergency conditions. The four stoves were equipped with Steinbart pressure burners having a gas burning capacity of 6000 cubic feet per minute of blast furnace gas.

Clean gas is necessary to prevent plugging the stoves as use of ball fillers restricts the checker openings. Gas cleanliness required for this type of stove is below 0.025 grains of dirt per cubic foot.

New System for Cleaner Gas

To meet these gas-cleaning requirements, a new system was set up, designed to handle 15,000 cubic feet per minute which is slightly more gas than necessary to furnish the required hot blast temperature. Original gas-cleaning system consisted of a dustcatcher and horizontal Dovol washer. This was left intact, connected to wash all of the gas made.

New cleaning system consists of a 10-foot diameter tower washer having a 53-foot straight side. Cleaning element is made up of three 4-foot banks of tile. Water for cooling and washing is introduced through an internal spray header having nine 2-inch "full cone" spray nozzles, so spaced that uniform water distribution is obtained. Top section of washer contains a channel-type moisture eliminator which partially dries the gas as it leaves the washer.

This style of equipment is capable of cleaning the gas to 0.300 grains per cubic foot and cooling it to within 10 degrees Fahr. of the inlet water temperature. After leaving the primary washer, the gas is "fine cleaned" in a 60-tube Cottrell electrostatic precipitator where 95 to 98 per cent of the remaining dirt is removed.

Utility requirements of this cleaning equipment are 400 to 450 gallons per minute of water for the primary washer. Precipitator requires 35 gallons of water per minute, 1000 pounds of steam per 24 hours and approximately eight kilowatts of electric power.

Operating Expenses Reduced

With this type of gas cleaning equipment, it is unnecessary to clean the stoves or flush the mains and burners. Also, it gives a reliable and low-cost system as operating expenses are lowered and delays on the furnace, necessitated by periodic shutdowns, are minimized.

At the time this work was done, the old hot blast main was removed and a larger main installed allowing for a suitable straight connection of main before entering the bustle pipe, thus improving the distribution of blast around the furnace. Old underground gas flues to the stove burners also were abandoned and replaced by overhead gas mains, eliminating a source of danger and continual irritation to the personnel. A pneumatic hot blast control system was installed to enable the operators to gain the greatest advantage from the increased capacity of stoves.

At the same time that the stoves and gas cleaning systems were being rebuilt, American Rolling Mill Co. was completely rebuilding the stock house. A rather unorthodox handling system was devised (to be described in an later article) which has proved highly successful.

After 18 months' operation of the modernized plant, a study of operating data reveals that a splendid record was made, not only from the standpoint of economical furnace operation but also with regard to elimination of delays and operating difficulties previously encountered. These are indicative of the results which can be accomplished by relatively modest outlay to remodel a small isolated furnace.

The Sixth Street furnace of American Rolling Mill Co. at Ashland, Ky., also was remodeled, but along slightly different lines. The history of this plant was much the same as that of the Norton furnace except that the Sixth Street plant had never been equipped with mechanical filling equipment as size of furnace did not warrant such an expense. If any changes were to be made on the stacks themselves, new and larger furnaces would be built. For this reason, no work was done on these furnaces or the charging equipment.

One Furnace Dismantled

This plant was originally laid out for two furnaces to be blown in parallel, using constant pressure rather than at constant volume as is done in some European plants. Rather than incur the expense involved in fixing up the second furnace, one furnace was dismantled at Sixth Street in 1937 when American Rolling Mill Co. purchased the Norton plant. This left eight stoves for the remaining furnace. Two of these were dismantled a few years ago leaving stoves Nos. 1, 2, 3, 4, 7 and 8 which were capable of delivering an average blast temperature of 1270 degrees Fahr. blowing 30,000 cubic feet per minute. All the gas was burned as it came from the dust catcher, necessitating large checker openings and the usual procedure of stove cleaning.

Since all these stoves were relatively old, it was felt advisable to put in larger stoves rearranged to give a more conventional and workable layout. This was accomplished by moving the three Etna furnace stoves from Ironton to a new foundation at the Sixth Street plant. These stoves are 20 feet in diameter and 100 feet high, have 70,000 square feet heating surface and 1,-

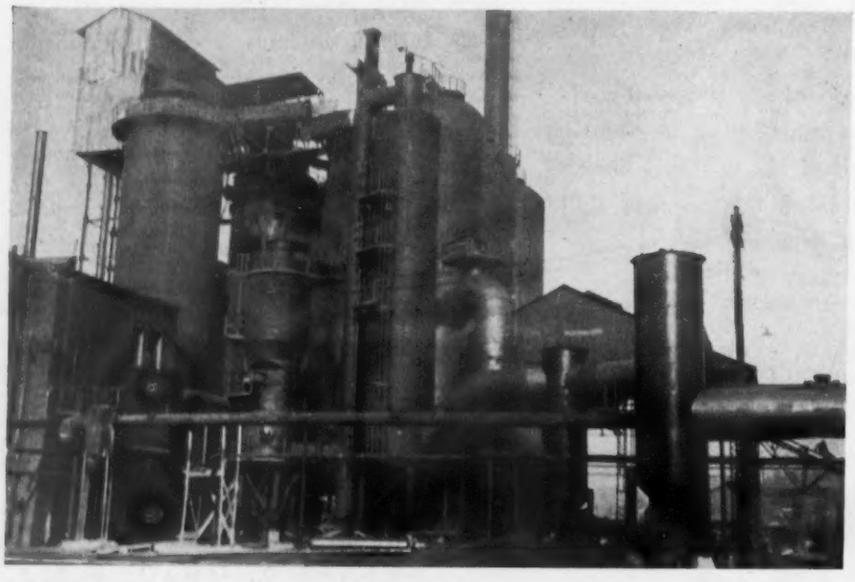

Fig. 2—General view of stoves and gas cleaning equipment at Sixth Street furnace of American Rolling Mill Co., Ashland, Ky.

200,000 pounds of checker brick with flue openings 3¼-inches square. The old No. 8 stove was kept in the system as a spare for it was the newest of the old stoves, and its location fitted into the new layout. These four stoves were equipped with Steinbart pressure burners of 6000 cubic feet per minute capacity. Old underground gas flue and stack flues were abandoned, as was the old hot blast main.

Gas Washer Increases Efficiency

To increase efficiency of the stoves and eliminate necessity for stove cleaning, a new gas-washing system adequate to clean stove gas was installed. This included a tower washer duplicating that furnished for the Norton furnace plant and a Traughber oil flotation cleaner for fine cleaning. Use of this type of washer for fine cleaning of blast furnace gas is a new development which may prove extremely interesting for cleaning gas to a moderate degree of cleanliness. In this installation it is expected to remove at least 50 per cent of the dirt entering the unit.

Cleaner consists of two drum spray units which produce a sheet of fine spray across the washer, as the drums rotate at 1200 revolutions per minute and are slightly immersed in water. After passing through this section of the unit, gases go through bubble caps which are immersed in water treated with pine oil. This oil is a good frothing agent and produces a mass of fine bubbles, thus exposing a large surface for the collection of the fine dust particles. This style of washer has been used with great success in cleaning gases from foundries and in other industrial processes, but has never been used on blast furnace gas before.

Coatings of Thin Silver Commercially Feasible

■ THE NINTH progress report on the second silver research campaign of the American silver producers' research project, national bureau of standards, Washington, A. J. Dornblatt, senior research associate, reveals considerable progress in the commercial coating field. Active experimental work in coatings has narrowed down to three methods. The work on cold bonding is about complete. That on alloys has been extended to include some suggested new fields.

Several firms are reported working on the welding of fine silver sheet to a base metal backing, and no critical obstacles seem to have been encountered. Where spot welding is employed, the spots must be sufficiently numerous to supply adequate heat transmission in boiling vessels, etc.

Spraying Inaccessible Surfaces

Sprayed coatings introduce a difficult question in the control of uniformity of thickness and porosity. This is of particular importance with a relatively valuable material such as silver. One of the main applications of spraying is to coat surfaces inaccessible by other methods.

Silver-clad steel, nickel, etc., already are in limited use and only await commercial demand to find a place in industry. A bond, perfect both mechanically and thermally after great deformation, can be obtained. Tubing may be manufactured by similar methods, also.

It has not been found possible to get adherence of silver on steel by hot-dipping methods although various temperatures, atmospheres and grades of material have been investigated. Curiously, it has been found possible to get an indestructible bond between a heavy electroplate and steel by merely heating the material briefly to about 1600 degrees Fahr. This may be due to transition to beta iron. This would form a basis for making clad material by rolling down, but does not seem a logical way to make a duplex ingot. Heavy cladding can be done better by known methods and thin coatings plated direct.

Electroplating Has Progressed

Electroplating to deposit thin nonporous coatings, by what may be called standard plating technique, has progressed steadily. Special attention to cleanliness and to conditioning of cathode surface appears necessary. Nonporous coatings 0.0001-inch thick can be produced without any difficulty and 0.00005-inch now is attainable with special care. Some changes in technique have been adopted to avoid hydrogen embrittlement of steel cans which might cause difficulty in attaching the ends. Cans plated with 0.001-inch copper followed by 0.0001-inch silver are under test packed with food products.

These coatings are too thin to justify major forming operations after plating and therefore are applied directly to formed parts before assembly. The 0.001-inch coatings used for barrels and special chemical containers are a separate problem. Here the disks are plated before forming and no difficulty is encountered once the necessary care is taken in the forming shop to have perfectly smooth dies and to handle the soft silver faces with reasonable respect when applying tongs, etc. Troubles in joining barrel halves have been eliminated largely by minor changes in the dies to give a lap instead of a butt joint. High-frequency induction gear is being investigated for brazing, although it can be done with rotating gas flames.

The pilot plating plant at the bureau of standards has been duplicated in an additional room so experimental work can now be done apart from pilot production.

Brush plating without doubt will give thinner nonporous coatings than have yet been obtained by standard plating procedure provided proper handling is given.

Turbulence plating is being studied as it may have possibilities of offering a promising attack upon the porosity, time and output per plating unit. It may be found that extremely thin coatings can be so prepared.

Coating by Chemical Reduction

Chemical reduction, together with vaporizing and sputtering, represents a method for obtaining exceedingly thin coatings in the order of two millionths of an inch thick but presumably with some pores. This method is in commercial use for coating vacuum flasks, etc., and costs are satisfactory. It requires a knowledge of optimum solution temperatures and concentrations and also involves recovery of silver from waste solutions and care to avoid explosive compounds. Considerable experience has been gained in use of this method, but it appears about to be displaced commercially by vaporization.

Vaporization is being used by a number of plants and is a relatively new method of obtaining extremely thin deposits. The method is simple and rapid, and apparently adherent coatings are readily made. Not much is yet known about porosity. Silver is put on a suitable refractory material in the center of a can shell with an electrical heating unit, the whole placed in a vacuum and the silver vaporized.

Cathode sputtering appears of little practical value due to long time required to get a coating of appreciable thickness and the apparent lack of any advantages over other methods.

In addition to coatings, some other developments have been made. There appears to be some possi-

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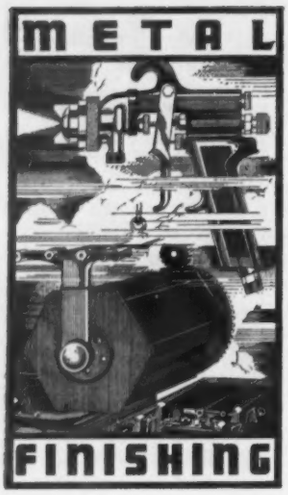


Structural Steel

Adequate surface protection of structural steel deserves careful attention at the fabricating plant. The author, widely experienced in this field, points out what should be done to process the steel efficiently and at lowest cost

By **HAROLD E. KENNEDY**
Chemical Engineer
Pittsburgh

■ IN THE PAST few years increased attention has been paid to the painting of structural steel, both in the paints themselves and in their proper application. However, even today where a particular type or brand of paint is specified, there is yet no assurance of lasting results in many cases.

Possibly the greatest factor affecting the quality of the shop painting is weather conditions. In the great majority of fabricating shops no provision is made for painting under cover to say nothing of keeping the temperature at a desirable level. No impervious film can be expected to hold tight to damp steel. Also it is commonly known that no painting should be done when the temperature of the steel or the atmosphere is below 45 degrees Fahr. In spite of these two commonly known facts of temperature and moisture, poorly painted steel is still a problem.

The most regrettable part of this situation is that the larger and more important the job going through the shop, the more likely it is that it will not be painted as it should. Since most erection of steel structures is done in favorable weather, most fabrication is done during the winter. As each section is finished in the shop, it is shifted out into the yard or into a poorly constructed shed where it is almost impossible to maintain suitable atmospheric conditions. Rain or snow and cold get into the steel before it can be painted.

Because of lack of space and time, there is great resistance to bringing the steel into a suitable room before the paint is applied. Seldom is the steel allowed to lie in a warm, dry room until the condensed moisture has evaporated and the steel has warmed up to the required 45 degrees. Few shops have a room where the steel can be warmed and dried.

Structural steel is a low priced item and it must be kept low priced. As far as paint is concerned, this will be done by either eliminating shop painting or shop painting technique will be improved to meet the demands of progressive engineers who insist on full value for the money spent on painting.

Surface and Painter Important

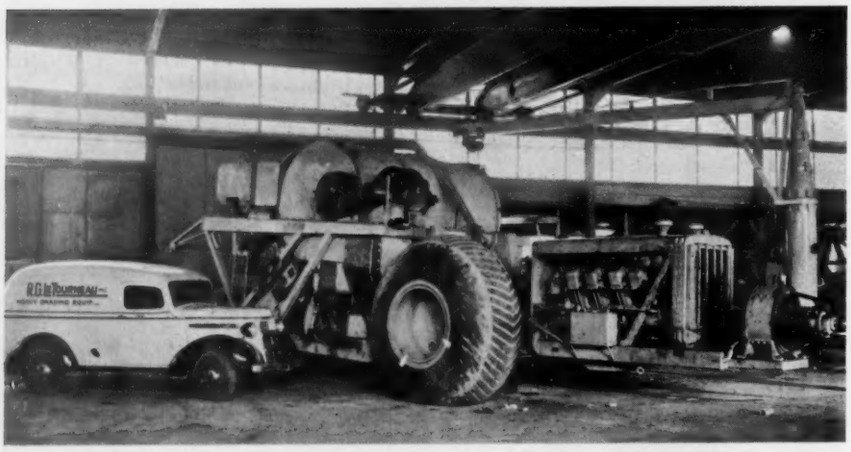
It is an axiom of the paint manufacturers that the paint itself is only one-third of the job; the other two-thirds are the surface and the painter. So long as shop painting is done, the fabricator will control these latter two-thirds.

If the engineer on the project feels it necessary to draw up rigid specifications for painting, the fabricator may expect his costs to skyrocket because he will be required to sandblast or shotblast all of the steel or to use chemical treatments to prevent rust as well as to provide proper conditions for painting.

While paint manufacturers are developing paints that will outlast those now used by from three to five times, the trend is toward synthetic resin vehicles which are more sensitive to poor shop practice than many of the old paints. Impetus has been added to these develop-

(Please turn to Page 58)

Traveling Fabricating Shop



■ **For size, compare this giant machine with the truck. The tires are 7 feet in diameter. Built as an experimental unit, this sugar-cane harvester will be "field engineered," any mechanical or structural "bugs" being ironed out with new parts made on the spot in the truck, equipped as a traveling fabricating shop and moved about the country with the harvester. The 160-horsepower diesel and large overhung generator furnish electric power for the various motors driving individual conveyors, etc. Unit built by R. G. LeTourneau Inc., Peoria, Ill. Photo courtesy Lincoln Electric Co., Cleveland**

VEXING PROBLEM SOLVED BY "CARBOFRAX" SKID RAILS

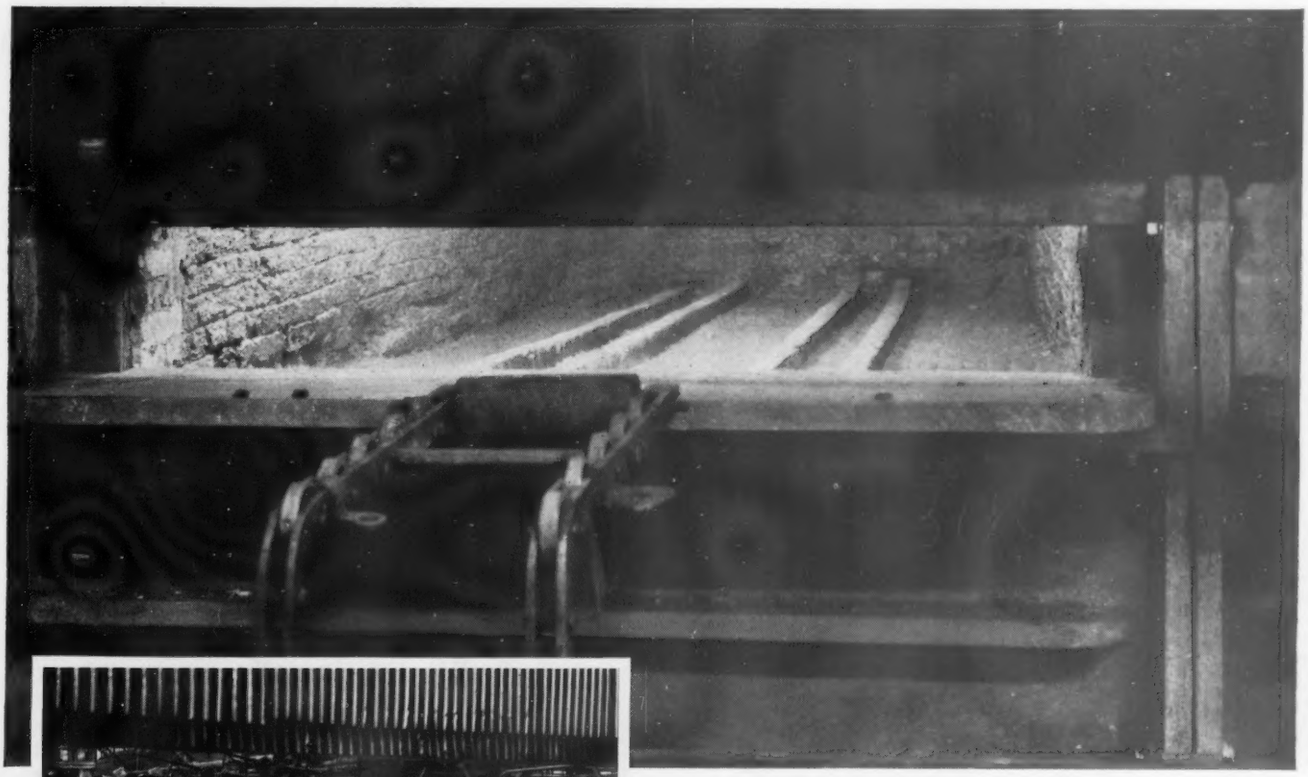
THIS pair furnace, for the heating of chromium and stainless steel flats, was originally designed with a flat hearth of fireclay brick.

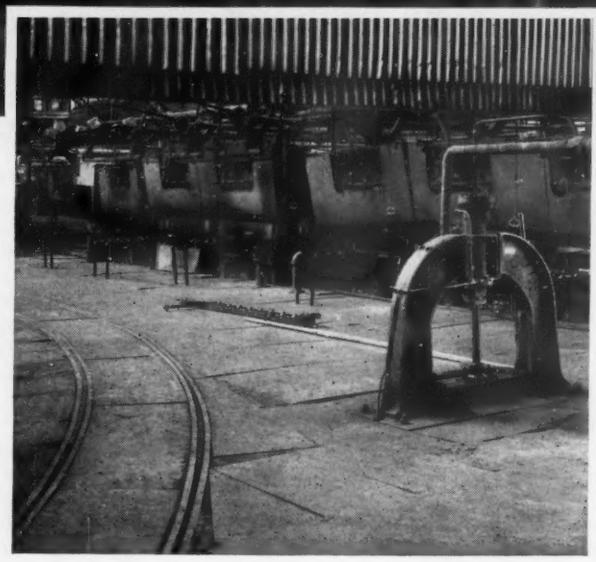
The constant abrasion of the sheets wore the hearth badly and the brick dust had to be blown off the floor at intervals to keep it from sticking to the work. Even with this precaution each flat had to be dusted off after heating.

Rails of various refractory materials had been tried with little success because they were quickly worn down. Then rails of "Carbofrax", the Carborundum Brand Silicon Carbide super refractory, were installed and the picture shows their condition after three years—corners straight and true, good for many more years of service. During that time the operator has had no trouble whatever with brick dust—the use of air hoses has been discontinued entirely.

And the work of charging and discharging has been simplified—it's easy to get the tongs under the flat, elevated 3 in. from the hearth.

Workmen are better satisfied, production has been increased and the possibility of spoilage in the rolling process due to adherence of brick particles has been eliminated. Once again "Carbofrax" has solved an industrial refractory problem.





REFRACTORY CARBORUNDUM PRODUCTS

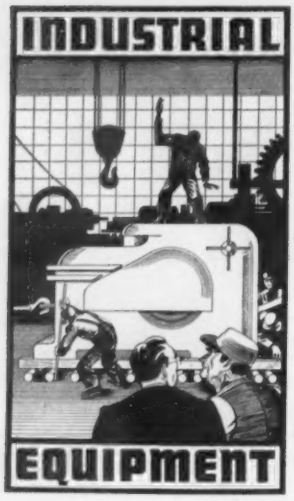
THE CARBORUNDUM COMPANY

REG. U. S. PAT. OFF.

REFRACTORY DIVISION, PERTH AMBOY, N. J.

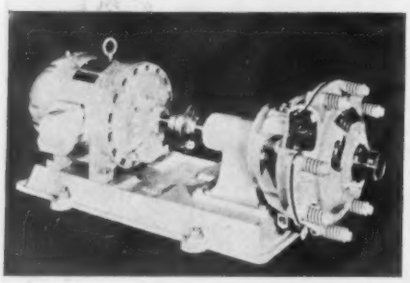
District Sales Branches: Boston, Chicago, Cleveland, Detroit, Philadelphia, Pittsburgh.
Agents: McConnell Sales and Engineering Corp., Birmingham, Ala.; Christy Fire Brick Company, St. Louis; Harrison & Company, Salt Lake City, Utah; Pacific Abrasive Supply Co., Los Angeles, San Francisco, Seattle; Denver Fireclay Co., El Paso, Texas.

(Carborundum and Carbofrax are registered trade-marks of The Carborundum Company)



Glass Acid Pump

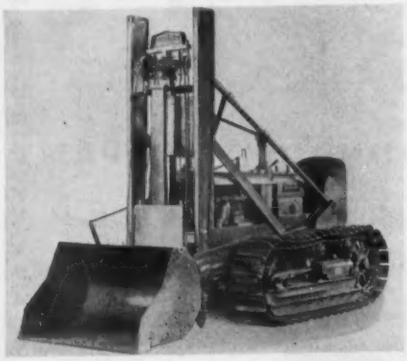
■ Nash Engineering Co., South Norwalk, Conn., offers centrifugal type acid pump in which pumping action is secured from force of rotating liquid. Casing, rotating impeller and all parts in contact with corrosive liquid are of clear, chemi-



cal-resistant glass. Pump handles 6000 gallons and will deliver it 70 feet above suction level. Neither boiling temperatures nor strong acids such as muriatic, but with the exception of hydrofluoric or glacial phosphoric, affect Pyrex glass of which pump is made. Interior of pump can be watched while pump is in operation.

Tractor Shovel

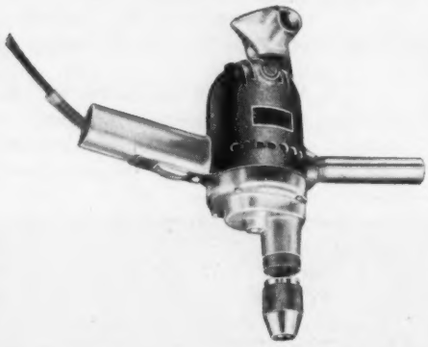
■ Frank G. Hough Co., 919 North Michigan avenue, Chicago, has recently announced its Special-Modified International T-35 and TD-35 tractor shovels. Special long tracks, 6-roller truck frames, spring loaded foot clutch, double steering clutches



and reverse radiator fan are incorporated in tractors. Heavy steel plate bucket fitted with high carbon cutting edge has ¾-yard capacity. "Thrust" of bucket is taken directly against lower part of guide frame through hardened cast thrust shoes, no stresses being transmitted to rear of tractor. Bucket raises about 9 feet in 11 seconds or less, drops in 6 seconds and has a maximum dumping clearance of 7 feet.

Breast Drill

■ Speedway Mfg. Co., Cicero, Ill., has announced its "89" ½-inch portable industrial drill weighing



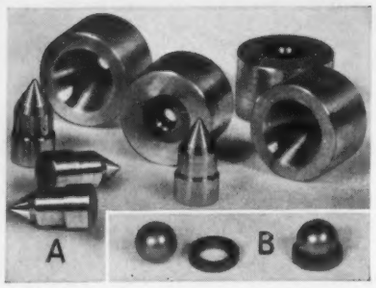
9½ pounds and having combination breast and end-handle design (gripped cross-ways instead of in pistol fashion). Motor operates at 500 revolutions per minute (spindle speed) and will not stall under a 500-pound thrust while drilling at capacity. Unit has improved air cooling, self-aligning oil-less bearings, removable side handle for close quarters, sliding thumb switch and two-tone finish of blue crackel and lacquered white metal. Price is $24.50.

Nusite-Hardened Tools

■ Perfection Tool & Metal Heat Treating Co., 1740 West Hubbard street, Chicago, announces bits, flats and squares hardened by Nusite method developed by W. S. Nusbaum. Greater toughness is said to enable these tools to hold an edge much longer under severe service. Large tools also may be tipped with Nusite. This process is claimed to fill the gap existing between commonly-hardened high speed steel and the various carbides.

Intermetallic Valves

■ McKenna Metals Co., Latrobe, Pa,. has developed high-pressure needle valves equipped with Kennametal needle tip and seat. Used in experiments involving a tarry fluid containing grit, only one valve had to be replaced every one to two weeks, while as many as seven ordinary valves had to be changed in 24 hours. Tests were made in which Kennametal balls were hammered



against seats of Kennametal by a pneumatic hammer, using 300 blows per minute of ram, 25 pounds per square inch air pressure and 3/32-inch play between ram and ball and seat. After 105 minutes of hammering, valves were still serviceable, as compared to a life of 9 to 11 minutes for other balls and seats. Kennametal valves also showed resistance to corrosion in waters of Louisiana oil wells.

Blower Trap

■ Breuer Electric Mfg. Co., 5100 North Ravenswood avenue, Chicago, has developed Skraptrap for use on Tornado portable electric blower when it is used for vacuum cleaning.

Unit collects and salvages small objects drawn into nozzle, thus preventing bolts, nuts, screws, nails, etc., from reaching and injuring suction fan blades, while dust, dirt and lint pass into dust bag.

Hard Chromium Plating Inside Tubing Bodies

■ Tomkins-Johnson Co., Jackson, Mich., announces hard chromium plating 0.001-inch thick inside tubing bodies of nonrotating cylinders for compressed air and water. Moisture from condensation of compressed air or water (as in water hydraulic cylinders) acts as lubricant. Outside diameter of piston rod also is hard chromium plated. All tubing bodies for cylinders up to and including 8-inch bore and on the 10 and 12-inch bore cylinders of strokes up to 7 inches are hard chromium plated.

Produces Forging Ingots That Weigh Up to 500,000 Pounds

■ LATEST ADDITION to mold equipment at Homestead works of Carnegie-Illinois Steel Corp. permits the casting of commercial forging ingots in ingots weighing up to 500,000 pounds each. Corrugated or fluted round ingots are cast in 31, 34, 39, 44, 48, 55, 70 and 95-inch molds, in lengths to 145 inches depending on requirements. All molds 70-inch or larger are made in the company's shops. Corrugated slab ingots are made in three sizes and in body lengths up to 145 inches. All forging ingots are cast big end up.

Close attention is paid to temperatures, a reading being taken at the furnace just prior to tapping, again at tapping, and finally at the ingot mold as teeming begins and ends. Ordinarily the steel is tapped at 2925 to 2960 degrees Fahr. Care is exercised to avoid splashing as teeming begins. The metal ordinarily is teemed into the molds at 2810 to 2840 degrees Fahr.

Slag Control at Furnace

To assure uniformity of the open hearth steel for the forging ingots, slag control is exercised at the furnace, slag "pancakes" being taken at frequent intervals. This is in addition to the regulation chemical analysis made during the course of a heat. Ordinarily 10 slag samples are taken during the working of each heat. All slag samples taken from the three preceding heats are racked near the furnace to serve as visual guides to the melter while working up a heat. Steel for forging ingots is killed in the furnace or ladle, but no mold additions ever are made.

Ladles have capacities ranging from 50 to 90 net tons each. One to three heats may go into a single ingot. In the case of ingots smaller than 95-inch diameter the size of the ladle nozzle is governed by the cross-section of the mold being filled, adjusted by a factor determined by the type steel used.

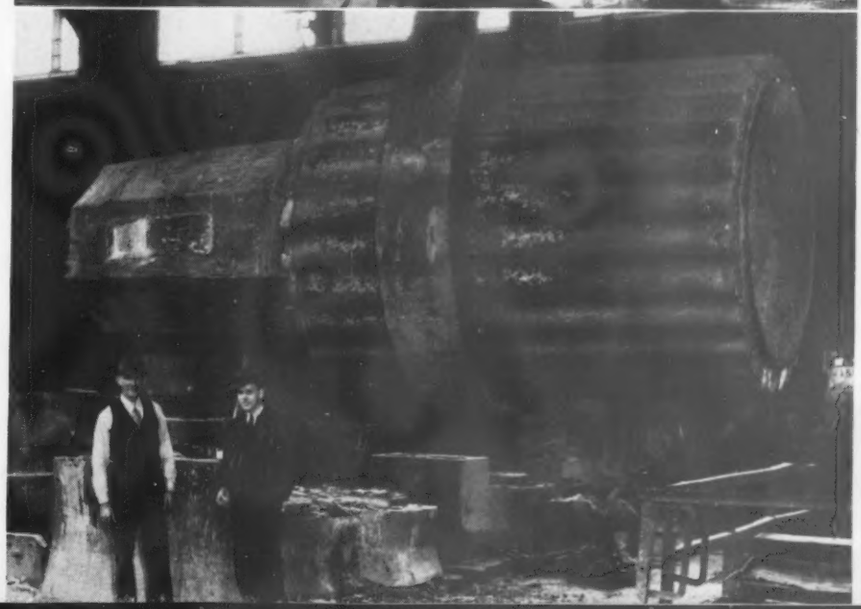
When the molds are large enough to require two or more ladles of steel, pouring boxes are used, with 4½-inch nozzles from the runner boxes to the mold. In every case the nozzle in the box and its angle is so set as to keep the surface of the rising column of steel well agitated in the mold. This is particularly important in the case of alloy steels. Someone from the supervisory staff, as well as a metallurgical observer, constantly is on duty during the teeming operation to watch the surface of the metal as it rises in the mold and to make adjustments in the teeming rate if necessary. Speed of pouring, depending on cross-section of the ingot, is varied from 5000 to 25,000 pounds per minute so as to obtain a specified rate of rise of the metal in the mold.

Ingots To Order

Although the Homestead works is equipped to turn out finished forgings, ingots and semifinished pieces for further processing are also supplied to other companies in alloy or carbon steel, annealed according to specifications.

Stripping time on heavy forgings ingots varies from approximately nine hours on smaller sizes to about 40 hours for the 95-inch ingots, being controlled by the smallest cross-sectional diameter of the ingot and the type of metal. The sinkhead flask is pulled from 1 to 2 hours before the ingot is stripped. Sinkhead flasks for the round ingots are lined with brick. Flasks for the slab ingots are lined with rammed foundry sand. Size of sinkhead ranges from 15 to 25 per cent of the ingot body, depending on grade of steel and type of forging. Casting is done in a concrete walled pit 20 feet deep, 19 feet 6 inches wide and 165 feet long.

Following stripping, forging ingots usually are transferred to a preheating furnace on special 4-truck, 16-wheel, standard gage, ingot cars. They are allowed to equalize at 1200 to 1300 degrees Fahr., time and temperature depending on size and composition of the ingot being treated. The preheating furnaces are gas-fired, 11 feet high, 12 feet wide and 39 feet long, of the car-bottom type. Burner ports are in two rows on each side. Pyrometers in each furnace connect with chart recorders in the office, insuring close control over temperature during the preheating period as well as the period required to raise the ingot to forging temperature.



(Above)—Teeming a 95-inch forging ingot from two ladles. Teeming temperture is from 2810 to 2840 degrees Fahr. (Below)—This corrugated round forging ingot was cast big end up. Ingot is now ready for equalizing furnace

Speeds Coal Handling

(*Concluded from Page* 40)

ute are provided for operation of the hoist. Auxiliary boom and cab can travel 600 feet per minute each, which gives the bucket a speed of 1200 feet per minute. Maximum rate of travel of the bridge over its tracks is 60 feet per minute. Each end of the bridge is driven independently, design permitting a skewing of from 1 to 18 degrees from perpendicular.

Each bucket load can be weighed by a scale located in the operator's cab; one button provides the tare weight, another the gross weight. Reweighing is prevented by an automatic shut-off.

Total weight of the bridge is 140 tons, which is said to be about two-thirds of that required for the type of construction commonly used for this purpose. Weight of the bucket is 2½ tons.

A short distance in from the land side of the bridge is another set of tracks on which are ten hoppers, eight constructed of steel and two of wood. Five of the hoppers are for anthracite coal, three of steel and two of wood, the former being equipped with shaker screens. Two for the steel hoppers are for coke and three more for bituminous coal. Those for anthracite and coke move by their own motors. Capacity of the hoppers varies from 150 to 175 tons.

While the Kokancoal Co. engages for the most part in retail trade, it performs stevedoring service for an associated company, the Transocean Coal & Transport Corp. The handling equipment described in this article occupies only about one-half of the present yard. One of the features of the facilities for retail business is an elevated scale house located between two scales. From this location the weighmaster can see the trucks as they are weighed.

The coal bridge was designed and built by the Engineering Works division, Dravo Corp., Pittsburgh. The new steel hoppers were erected by the Fanning-Schuett Engineering Co., Philadelphia. Motors and other electrical equipment were manufactured by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The bucket was supplied by the Hayward Co., New York, and the scales by the Howe Scale Co., New York.

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What's New at Pittsburgh . . .

(*Concluded from Page* 21)

definite grain structure throughout the full length of sections. Operating temperature will be 950 degrees Fahr., under 1500 pounds pressure.

TATA IRON & STEEL BUYS NEW EQUIPMENT IN U. S.

Increasing output of the Tata Iron & Steel Co. 100,000 tons annually, two new 3-high sheet mills have been ordered from Lewis Foundry & Machine division, Blaw-Knox Co. The mills are slated to take ⅝-inch sheet bars and reduce them to 16-gage sheets in two single and three paired passes. Mills will be of the Jump type, 20 x 33 x 52 inches, with bottom rolls power driven. Roll speed will be 30 revolutions per minute, and all rolls will be equipped with three-station water sprays. Middle roll is equipped with an adjustment to facilitate lateral alignment.

Screwdowns will be hand operated. Operator has water valves located on his side of the mill so the shape can be controlled by turning a valve. In the case of table operators, routine control is by a foot switch with fingertip emergency, and adjustments of tables to mill setup are done by hand wheels.

Company also has received an order from Forges de Leval Aulnoye of northern France for a 3-high sheet mill. In accordance with a recent arrangement covering the manufacture and sale of certain Blaw-Knox products for European markets, Detombay of Charleroi, Belgium, will assist in producing this mill. Lewis Foundry will do the engineering and provide certain parts and all of the rolls.

The unit will be a "balanced" mill, with two of its three rolls power driven, and equipped with automatic roller and catcher tables; automatic screwdown; new shape control water sprays; and special mechanical features to permit rapid roll changing.

LABOR TROUBLES BLAMED FOR CONTRACTORS' FAILURE

Bankruptcy proceedings involving Gilbert-Varker Inc., builders of the Clairton housing project intended for Carnegie-Illinois Steel Corp. workers, were started last week.

Project, including 300 dwellings, was completed several weeks ago. About 100 houses have been sold.

Labor troubles have been the major factor in the financial difficulties. Sabotage activities as well as exorbitant wage rates and jurisdictional disputes are blamed for the failure. These and other factors boosted the cost of the project well above the contract agreement of $1,050,000.

Significant was the wide use of steel in the houses. This itself was a sore point with the labor unions. Most members were not acquainted with these applications, bringing up disputes over the installation.

■ Wage earners' living costs in the United States declined 0.1 per cent from May to June, according to the industrial economics division, National Industrial Conference board. June costs were 2.3 per cent below June, 1938, and 14.8 per cent below June, 1929.

■ Securities and exchange commission has granted the application of the Wheeling stock exchange for permission to extend unlisted trading privileges to the 5 per cent cumulative convertible prior preferred Wheeling Steel Corp., stock.

Bi-Metal Steel Valves

(*Concluded from Page* 46)

Fig. 4 shows three stages in preparation of globe valve disks and seat rings.

After assembly into valves, contact bearing surfaces between disks and rings are checked by taking impressions with Prussian blue. Any slight irregularities are removed by lapping.

Use of cobalt-chromium-tungsten alloys as deposited material has vastly improved reliability and operating life of valves undergoing severe service. Use of such surfacing materials is constantly being extended. Crane Co. alone produced in the last eight months of 1938 a total of 52,624 parts with alloy surface deposits, consisting mainly of disks and seats ranging in size from ¼ to 18 inches in diameter. Increased temperatures and pressures no doubt will see further development of surface hardening materials for valve seats.

•

Coatings of Thin Silver Commercially Feasible

(*Concluded from Page* 51)

bility for development of graphite brushes impregnated with silver for motor and generator use as such brushes operate at lower temperatures and better equalize the current between brushes in parallel.

It has been demonstrated that excellent welds of silver-plated steel can be made by controlled resistance methods. Telephone laboratories have developed some silver-rich tin alloys in their contact research. Silver-lead bearings are apparently receiving active attention in the airplane field. Dow Chemical Co. has developed "Z1" wrought alloy, now on the market and containing 5.5 per cent of silver with some aluminum, zinc and manganese. This material shows unusually high yield strength without loss of corrosion resistance. It is curious to note that addition of silver to almost any alloy seems to raise the yield point, but unfortunately it also takes a substantial amount of silver to do it.

Silver Affects Tin Plate Porosity

In field of tin-silver alloys, several steel companies are experimenting with additions of silver to the tinning pot to see if porosity of the tin plate may be improved by small additions. Use of silver to harden tin may expand rapidly. Tin foil is hardened considerably by the addition of 3.5 per cent of silver, the added strength permitting a thinner bottle cap lining to be used for mineral water, etc. Interest also has been shown by hospitals and laboratories in silver-bearing tin sheet and pipe for handling sterile or distilled water.

In the lead-silver group, confirmation has appeared that addition of 0.01 per cent more or less of silver to storage battery plates results in a notable lengthening of life.

Some new lead-base cadmium bearings carrying anywhere from 0.5 to 6 per cent silver have appeared in patent literature.

One of the interesting developments in iron-silver alloys is the control of corrosion pitting of stainless steel in salt water by an "effective" addition of several tenths of a per cent of silver to standard 18-8 stainless. This appears to reduce pitting greatly. The material is being commercialized by several steel manufacturers.

Practice Reaffirmed

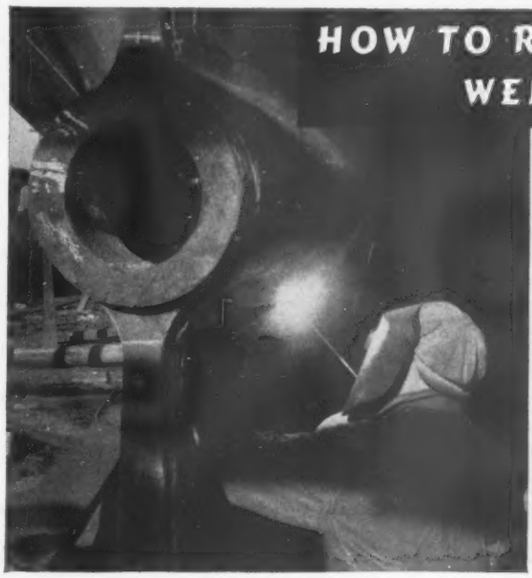
■ Division of simplified practice of the national bureau of standards, Washington, D. C., announces that simplified practice recommendation R164-36, "Tinned-Steel Ice-Cream Cans," has been reaffirmed by the standing committee of the industry. Copies of the recommendation may be obtained from the superintendent of documents, Washington, D. C. at 5 cents.

HOW TO REDUCE YOUR WELDING COSTS

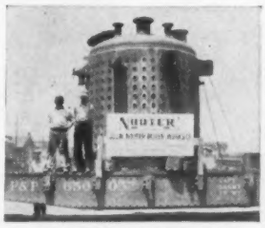
From coast to coast, in plants fabricating welded structures of every description, Murex electrodes are helping to reduce welding costs. The reasons why are many. In one plant high burn-off rate may prove an advantage. In another, rapid deposition, or lack of spatter and smoothness of deposit may do the trick.

There is little question but what, in your plant, too, these Murex features can effect real economies. Why not write today and ask to have a representative demonstrate Murex. No obligation is involved. And, if you have a problem or two concerning welding procedure, his broad experience may prove extremely useful.

We've a pocket-size pamphlet giving properties of all electrodes in the Murex line. Send for your copy.



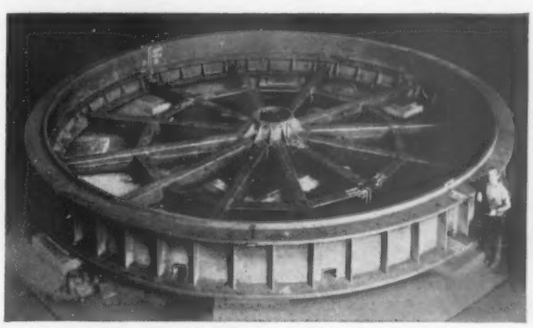
1 In marine work, vertical and overhead welding goes easily and quickly with Murex Vertex (reverse polarity) or Genex (straight polarity). *Photo courtesy Ira S. Bushey & Sons Co., Inc., Brooklyn, N. Y.*



2 Only 2700 lbs. of Murex welded this 40,000 lbs. jacketed still. *Photo courtesy John Nooter Boiler Works Co., St. Louis, Mo.*

3 High speed deposition saves time and money on the Lorain 79 Shovel. *Photo courtesy The Thew Shovel Company, Lorain, Ohio.*

5 Economy of welding machinery such as this sluice gate hoist is increased by time-saving Murex Electrodes. *Photo courtesy Lakeside Bridge & Steel Co., Milwaukee, Wis.*



4 Free-flowing Murex downhand electrodes speeded welding on this 96,200 lb. pot chuck, 33 ft. 7 in. in diameter, believed to be world's largest. *Photo courtesy Lukenweld, Inc., Coatesville, Pa.*

MUREX
HEAVY COATED
ELECTRODES

METAL & THERMIT CORPORATION
120 Broadway, New York, N. Y.
Albany • Chicago • Pittsburgh
So. San Francisco • Toronto

Structural Steel

(*Concluded from Page 52*)

ments by the fact that the railroads and other large users of steel have had their maintenance budgets reduced to a point where it is necessary to pay a bit more for original cost and get a structure that will not require large maintenance appropriations. It may develop that the near-future specification will call for sandblasting or the use of rust-inhibitive treatments or both before the paint is applied.

Competition May Affect Cost

Competition between fabricators may force the fabricators to absorb the largest part of these additional costs. The following are examples of what these costs may be: In a plant where a good grade of red lead is used, the average cost of cleaning and panting (including the cost of paint) on a large bridge was approximately $1.50 a ton, not including overhead.

On a similar job in the same plant but with a strict cleaning, treating and painting specification, the cost was approximately $2.15 a ton without overhead. On another strict specification, using some sandblasting, power brushing, treating and painting, the cost was approximately $2.75 a ton without overhead. Another large order with a strict specification showed a cost of about $2.40 a ton without overhead.

From the above figures it can be seen that the shop costs for painting alone may be increased from 40 to 80 per cent if it becomes necessary for construction engineers to specify each step of the painting procedure instead of allowing the fabricator to use his own initiative to do a good painting job.

Possibly one answer to the problem is to eliminate shop painting and apply all paints in the field. Especially if the steel is not to be inclosed, the best practice might be to let it weather for several months. This method has given good results in the past because much of the loose scale weathered off during transit and erection. This gave a solid surface for the paint to cling to and the painting was done in favorable weather.

Higher Painting Costs in Field

However, cost of application was much higher than in the shop, due both to inaccessibility and to the higher wage scale paid in the field as against that in the shop.

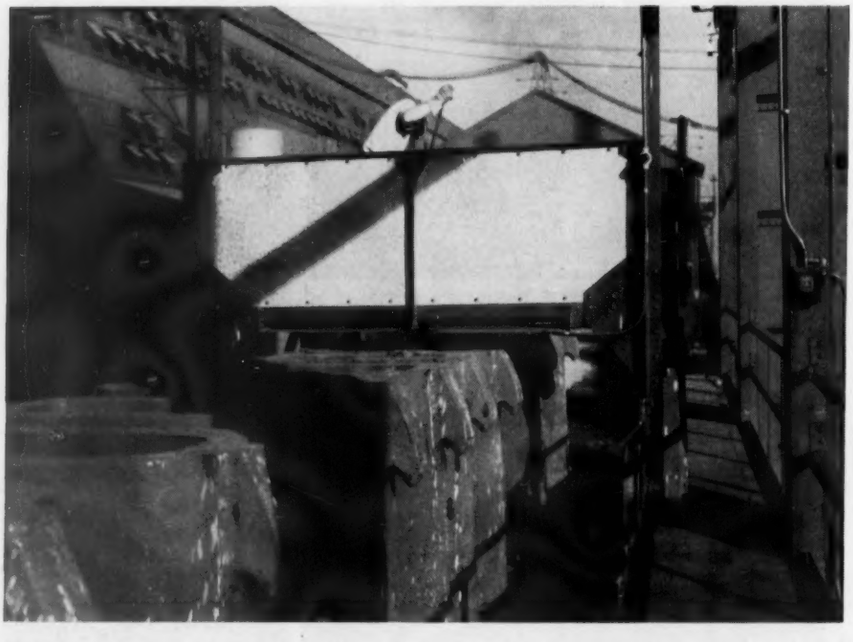
Too, most engineers prefer that the painting be completed within the job schedule rather than have it as a holdover operation for months after all other work is completed.

If painting is going to be done in the shop, ways to forestall rigid specifications should be considered. The first step in improving shop technique is to provide shelter for the steel until and during the painting operation. This can be done either by enclosing and heating sufficient yard space or by making the painting a definite part of the fabrication and doing it before the steel is sent out of the building.

The second and most important step is to provide proper cleaning equipment. The method next best to sandblasting and immediate painting is to use power-driven wire brushes to remove as much loose scale, filings and other dirt from the surface as possible. In nearly every case where a true study of power wire-brushing has been made, it has been found to be not much more expensive than hand brushing and it is far more efficient. By proper cleaning of the surface the paint gets a better chance to adhere to the steel and its chance of living a full economic life is improved greatly.

Even though provision of space and equipment for proper cleaning and painting in the shop may be a cost that the fabricator does not want to assume, it would be better to do this voluntarily and to give a good paint job than to wait until painting specifications are written that will increase costs to a point where profits disappear.

Protects Operator Cleaning Molds



■ **This motor-operated buggy is used in cleaning ingot molds at steelworks of American Rolling Mill Co., Middletown, O. Platform is completely enclosed with galvanized sheeting on all four sides and is insulated. Floor has a hole in center just large enough to allow operator to work easily when cleaning a mold. A floodlight illuminates entire interior of mold at all times. Buggy is of sufficient width to take care of any possible increase in mold size**

Great Lakes Red Book For 1939 Is Ready

■ *Great Lakes Red Book*, paper, 180 pages, vest-pocket size; published by Penton Publishing Co., Cleveland; supplied by STEEL, Cleveland, for $1; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, W.C. 1.

The owner, company manager, captain and chief engineer are given for each vessel and mechanical information on the type of vessel, its length, beam, depth, and for freighters, their carrying capacity, are included. Ships in commission this year are so indicated, but the list also includes those ships which are not in commission.

The second section provides a complete directory of shipbuilding and ship repair yards on the Great Lakes, with brief descriptions of their facilities for handling vessels' requirements.

A third section includes a port directory and full information on sources of various supplies required on shipboard.

All vessels are listed alphabetically for easy reference and the reader is referred to the proper one of the 274 fleets of ships on the lakes for complete information.

Operations Climb; Outlook Favorable

Steelmaking Highest In Nearly Eight Months; Bookings Increase

MARKET IN TABLOID ★

Demand
Widely diversified and still tending upward.

Prices
Bar extras revised; scrap up further.

Production
Rose 3½ points to 60 per cent.

■ INGOT production is at the highest rate in nearly eight months, and indications point to a maintenance or furtherance of recent gains in finished steel demand.

Last week's 3½-point upturn to 60 per cent in steelmaking extended the rise since the first week of July, when operations were reduced by the holiday, to 18 points. This recovery is sharper than that experienced by new business and releases against contracts, although July bookings of some leading products were 20 to 25 per cent ahead of June tonnage. Part of current ingot output is in anticipation of heavier requirements of the automotive industry.

Wide diversification of orders is noteworthy and accounts partly for the large tonnage moving to miscellaneous consumers. Buyers also show less tendency than was true earlier in the year to restrict orders to immediate needs.

The definitely better turn in business the past 30 days is aiding producers' attempts to strengthen prices. While it is too early for announcements regarding fourth quarter quotations, rumors are beginning to circulate in some districts that prices may be advanced shortly. At the moment, however, mills are concentrating on repairing what had been some of the weakest spots in the structure and are meeting with success in this regard.

New Extras Raise Bar Prices On Small Lots

Latest price moves include new extras on hot-rolled carbon bars which result in higher quotations on lots of less than 20 tons. Small changes also have been made in cutting, size, straightening and chemical extras. The recent decision to sell no more plain bars as reinforcing material is expected to be followed by further attempts to correct the chaotic price situation that has existed in concrete bar markets.

Releases of automotive steel are fairly heavy, considering that most assembly lines are down for model changes and that the strike of tool and die workers has retarded new model preparations.

Motorcar assemblies slipped 7000 more units last week to 40,595, as only Chevrolet and Ford among the larger interests continued in production. This compares with 30,390 a year ago. General Motors curtailed from 18,450 units to 15,030; Chrysler from 5900 to 2540; Ford from 17,000 to 16,875; and all others increased from 6070 to 6150.

Shipments of structural shapes and reinforcing bars comprise an important part of current steel deliveries. Inquiries continue fairly numerous but are smaller in total, and pending business is being reduced by recent awards. Outstanding is 6500 tons of shapes for a Boston life insurance company building, for which 2500 tons of bars has been placed; 4000 tons of bars for a reinforced pipe line, Salt Lake City; and 2788 tons of bars for a Los Angeles river channel.

A few large pipe lines are pending, a leading one being an oil line, involving 22,000 tons of steel, planned to be laid in Wyoming and Utah.

Railroads Mark Time In Equipment Buying

Some railroads are taking more steel for equipment repairs, although the pickup is not significant. Forecasts of carloadings this fall indicate a brief pinch will develop in freight car supplies in some districts. However, the carriers generally are holding proposed equipment building programs in abeyance, awaiting clarifications of the long-term business outlook and of government proposals for financing car and locomotive buying.

Possibility of an embargo on exports to Japan six months hence is expected to stimulate scrap shipments the remainder of the year. The leading outlet for exported scrap, Japan last year took 1,156,768 tons, in addition to 484,879 of iron and steel products. The domestic scrap market continues strong, with the composite up 4 cents to $14.91 on an advance in eastern Pennsylvania. The finished steel composite is unchanged at $55.60.

Principal contributor to last week's steelmaking rise was Cleveland, up 17 points to 73 per cent. Other gains were 2 points to 50 per cent at Pittsburgh, 2½ points to 56 at Chicago, 4½ points to 51 at Buffalo, 3 points to 84 at Birmingham and 1 point to 54 at Youngstown. Unchanged districts were eastern Pennsylvania at 41, Wheeling at 79, Cincinnati at 31, Detroit at 64, St. Louis at 47½ and New England at 40.

COMPOSITE MARKET AVERAGES

	July 29	July 22	July 15	One Month Ago June, 1939	Three Months Ago April, 1939	One Year Ago July, 1938	Five Years Ago July, 1934
Iron and Steel	$35.87	$35.86	$35.85	$35.69	$36.34	$36.32	$32.32
Finished Steel	55.60	55.60	55.60	55.70	56.50	57.20	54.05
Steelworks Scrap..	14.91	14.87	14.75	14.49	14.98	13.06	10.30

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	July 29, 1939	June, 1939	April, 1939	July, 1938
Steel bars, Pittsburgh	2.15c	2.15c	2.25c	2.25c
Steel bars, Chicago	2.15	2.15	2.25	2.25
Steel bars, Philadelphia	2.47	2.47	2.57	2.57
Iron bars, Terre Haute, Ind.	2.05	2.05	2.15	2.15
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.00	2.00	2.15	2.15
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.20	3.20
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.00	2.00	2.15	2.15
Sheets, cold-rolled, Gary	3.05	3.05	3.20	3.20
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.45	2.45	2.45	2.45

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods, No. 5 to 9/32-inch, Pitts.	43.00	43.00	43.00	43.00

Pig Iron

	July 29, 1939	June, 1939	April, 1939	July, 1938
Bessemer, del. Pittsburgh	$22.34	$22.34	$22.34	$21.34
Basic, Valley	20.50	20.50	20.50	19.50
Basic, eastern, del. Philadelphia	22.34	22.34	22.34	21.34
No. 2, foundry, Pittsburgh	22.21	22.21	22.21	21.21
No. 2, foundry, Chicago	21.00	21.00	21.00	20.00
Southern No. 2, Birmingham	17.38	17.38	17.38	16.38
Southern No. 2, del. Cincinnati	20.89	20.89	20.89	19.89
No. 2X, del. Phila. (differ. av.)	23.215	23.215	23.215	22.215
Malleable, Valley	21.00	21.00	21.00	20.00
Malleable, Chicago	21.00	21.00	21.00	20.00
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.34	28.34
Gray forge, del. Pittsburgh	21.17	21.17	21.17	20.17
Ferromanganese,del. Pittsburgh	85.33	85.33	85.33	97.77

Scrap

Heavy melting steel, Pittsburgh	$15.75	$15.00	$15.50	$13.75
Heavy melt. steel, No. 2, E. Pa	13.75	13.125	13.65	12.20
Heavy melting steel, Chicago	13.75	13.40	13.35	12.05
Rails for rolling, Chicago	17.75	17.65	17.25	17.05
Railroad steel specialties, Chicago	15.50	15.30	15.35	14.95

Coke

Connellsville, furnace, ovens	$3.75	$3.75	$3.75	$3.75
Connellsville, foundry, ovens	5.00	5.00	5.00	5.00
Chicago, by-product fdry., del.	10.50	10.50	10.50	10.80

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.00c
Chicago, Gary	2.00c
Cleveland	2.00c
Detroit, del.	2.10c
Buffalo	2.00c
Sparrows Point, Md.	2.00c
New York, del.	2.24c
Philadelphia, del.	2.17c
Granite City, Ill.	2.10c
Middletown, O.	2.00c
Youngstown, O.	2.00c
Birmingham	2.00c
Pacific Coast points	2.50c

Cold Rolled

Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast points	3.65c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.50c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.19-2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(*Base, 20 tons or over*)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast points	2.75c

Rail Steel

(*Base, 15 tons or over*)

Pittsburgh	2.00c
Chicago or Gary	2.00c
Detroit, delivered	2.10c
Cleveland	2.00c

Buffalo	2.00c
Birmingham	2.00c
Gulf ports	2.35c
Pacific Coast points	2.60c

Iron

Chicago, Terre Haute	2.05c
Philadelphia	2.37c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	1.80-2.05c
Detroit, delivered	1.90-2.15c
Gulf ports	2.20-2.40c
Pacific coast ports	2.50c
Philadelphia, del.	1.97-2.22c

Rail steel, straight lengths, quoted by distributors

Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm.	1.75c-1.90c
Detroit, delivered	1.85c-2.00c
Gulf ports	2.10-2.225c
Pacific Coast	2.35c

Wire Products

Pitts-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.40
Cement coated nails	$2.40
(Per pound)	
Polished staples	3.10c
Galv. fence staples	3.35c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.74; two-point cattle, 80-rod spool	$2.58
Annealed fence wire	2.90c
Galv. fence wire	3.30c
Woven wire fencing (base C. L. column)	67.00
Single loop bale ties, (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut Nails

Carloads, Pittsburgh $3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

* Delivered.

Alloy Bars (Hot)

(Base, 3 tons or over)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.70c

Detroit, delivered 2.80c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.00c
Detroit, del.	2.10c
Philadelphia, del.	2.32c
New York, del.	2.36c
Cooperage hoop, Youngs., Pitts.; Chicago, Birm.	2.10c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c

Carbon	Cleve., Pitts.
0.26—0.50	2.80c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass. $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Detroit, del.	3.05c
Worcester, Mass.	3.95c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12½ off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Elevator bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	67	70
⅞-1-inch	64	65
1⅛ and larger	62	62

Hexagon Cap Screws

Upset, 1-in., smaller	67.5 off

Square Head Set Screws

Upset, 1-in., smaller	75.0 off
Headless set screws	70.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.75c

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, 11 and 12	63½ 54
Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers	
and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	54
¾	66½	58
1—3	68½	60½

Iron

¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½"O.D.	13	$ 9.72	$23.71
1¾"O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼"O.D.	13	13.79	21.68
2¼"O.D.	12	15.16	.....
2½"O.D.	12	16.58	26.57
2¾"O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½"O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1 "O.D.	13	$ 7.82	$ 9.01
1¼"O.D.	13	9.26	10.67
1½"O.D.	13	10.23	11.79
1¾"O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼"O.D.	13	14.54	16.76
2¼"O.D.	12	16.01	18.45
2½"O.D.	12	17.54	20.21
2¾"O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½"O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½"O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B

Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl.	43.00
Do., over ⅜ to 41/64-in.incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Young., Buff Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Terre Haute, del.	10.00
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c

Per ton, bulk, f.o.b. port

Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.00	22.50	21.50	23.00
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.12	.....	.....	.....
Boston from Everett, Mass.	22.50	23.00	22.00	23.50
Boston from Buffalo	22.50	23.00	22.00	23.50
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birmingham	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.24	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95
St. Louis, northern	21.50	21.50	21.00	.....
St. Louis from Birmingham	†21.12	.....	20.62	.....
St. Paul from Duluth	23.63	23.63	.....	24.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $26.50, base; $27.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	$25.00
Pitts. dist. fur	20.50	do., del. Chicago	28.34
		Lyles, Tenn.	23.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $25.50; 6.51-7—$26.00; 7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9—$28.00; 9-9.50—$28.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar

Washed gravel, duty pd., tide, net ton	$21.00-21.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	18.00
Do. barge	19.00
No. 2 lump	18.00-19.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $80.00
Do., del. Pittsburgh 85.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman, 2½ carbon 88.00
2% carbon, 93.00; 1%, 103.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.60-1.65

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c
67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do., less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00
15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.00
Do, smaller lots 2.10

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do., 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 4.50c
Ton lots 5.00c
Less-ton lots 5.25c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50
Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: SAE 2300	Cold Drawn Bars: SAE 3100
Boston	3.88	4.06	5.06	3.85	3.85	5.66	3.71	4.78	4.61	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.40	4.60	4.50	3.51	4.09	8.59	7.19
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	4.55	4.28	3.51	4.06	8.56	7.16
Baltimore	3.70	3.85	3.80	3.55	3.55	5.00	3.55	4.90	5.05	....	4.05	....	....
Norfolk, Va.	3.90	4.00	....	3.75	3.75	5.20	3.75	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.35	4.40	4.40	3.42	3.75	8.15	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.50	3.35	3.65	8.35	6.95
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.55	4.62	3.20	3.75	8.15	6.75
Detroit	3.33	3.43	3.68	3.60	3.65	5.27	3.43	4.50	4.59	3.40	3.80	8.45	7.05
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	....	4.57	3.45	4.00	8.50	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.35	4.30	4.25	3.50	3.75	8.15	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.60	4.95	4.50	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.73	3.73	3.68	3.68	5.28	3.48	4.43	4.38	....	3.88	8.38	6.98
St. Louis	3.62	3.72	3.72	3.47	3.47	5.07	3.38	4.32	4.52	3.61	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Memphis	3.90	4.00	4.00	3.95	3.95	5.71	3.75	....	5.00	....	4.31	....	....
Chattanooga	3.80	3.90	3.90	3.85	3.85	5.80	3.65	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.54	4.64	4.64	4.41	4.41	6.01	4.32	....	5.39	....	4.79	....	....
Birmingham	3.50	3.60	3.60	3.55	3.55	5.88	3.35	....	4.85	....	4.43	....	....
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60	5.00	5.10	....	....
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	3.95	.	5.25	....	..	....	....
Seattle	3.90	4.10	5.45	3.85	3.95	5.75	3.80	6.50	5.00	....	5.60	....	....
Portland, Oreg.	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75	....	5.85	....	....
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.00	4.45	6.00	10.40	9.55
San Francisco	3.50	3.90	6.00	3.45	3.45	5.05	3.45	6.40	5.15	....	6.55	10.65	9.80

	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	....
Philadelphia	3.85	7.31	5.86	5.61	7.71
Baltimore	3.85	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.35	5.95	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.38	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.78	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.65	....	7.80	7.65	8.45
Portland, Oreg.	5.70	....	7.80	7.65	8.50
Los Angeles	4.65	9.40	8.55	8.40	9.05
San Francisco	4.50	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds, except 0-1999 pounds (hot rolled sheets only) in New York; 300-1999 pounds in Los Angeles; 0-299 pounds (hoops only) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York and St. Louis; 450-3749 pounds in Boston; 500-1499 pounds in Buffalo; 1000-1999 pounds in Philadelphia; 300-4999 pounds in San Francisco and Portland; any quantity in Twin Cities.

Galvanized Sheets: Base, 0-1499 pounds in New York, Tulsa; 150-1499 pounds in Cleveland, Pittsburgh; 1-9 bundles in Baltimore, Norfolk; 1-6 bundles in Los Angeles; 300-4999 pounds in Portland, Seattle, San Francisco; 450-3749 pounds in Boston; 500-1499 pounds in Birmingham, Chicago, Cincinnati, Detroit, St. Louis; 1500 pounds and over in Chattanooga, Philadelphia; any quantity in Twin Cities.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1000 pounds and over, except 0-299 pounds in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999 pounds in San Francisco; 0-1999 in Portland.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, July 27

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channe or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$23.40 5 0 0	$17.89	2 2 0
Basic bessemer	....	19.59	2 6 0
Hematite, Phos. .03-.05	23.57 5 5 0*	.....	.....
Billets	$34.52 7 7 6	$38.34	4 10 0
Wire rods, No. 5 gage	53.24 11 7 6	43.67	5 2 6
Standard rails	$44.46 9 10 0	$48.99	5 15 0
Merchant bars	2.30c 11 0 0	1.95c	5 2 6
Structural shapes	2.09c 10 0 0	1.76c to 1.85c	4 12 6 to 4 17 6
Plates, †¼ in. or 5 mm.	2.29c 10 18 9	2.14c to 2.33c	5 12 6 to 6 2 6
Sheets, black, 24 gage or 0.5 mm.	2.72c 13 0 0	2.95c	7 15 0*
Sheets, gal., 24 ga., corr.	3.29c 15 15 0	3.52c	9 5 0
Bands and strips	2.77c 13 5 0	1.95c to 2.00c	5 2 6 to 5 5 0
Plain wire, base	4.08c 19 10 0	2.33c to 2.76c	6 2 6 to 7 5 0
Galvanized wire, base	4.86c 23 5 0	2.99c to 3.09c	7 17 6 to 8 2 6
Wire nails, base	....	2.66c to 2.85c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 4.74 1 0 3	....	.....

British ferromanganese $80.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$23.17	4 19 0(a)	$18.00	679.30	$16.15	475	$25.28	63
Basic bess. pig iron	22.58	4 16 6(a)	.....	....	.....	...	27.89 (b)	69.50
Furnace coke	5.38	1 4 2	5.96	225	6.87	202	7.62	19
Billets	34.52	7 7 6	27.27	1,029	29.24	860	38.73	96.50
Standard rails	1.99c	9 10 0	1.69c	1,405	2.06c	1,375	2.38c	132
Merchant bars	2.42c	11 12 0††	1.56c	1,304	1.65c	1,100	1.98c	110
Structural shapes	2.17c	10 8 0††	1.52c	1,268	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.29c	10 19 3††	1.98c	1,650	2.06c	1,375	2.29c	127
Sheets, black	3.08c	14 15 0§	2.35c	1,958‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.61c	17 5 0	3.30c	2,750	4.05c	2,700	6.66c	370
Plain wire	4.08c	19 10 0	2.26c	1,880	2.48c	1,650	3.11c	173
Bands and strips	2.58c	12 7 0††	1.73c	1,444	1.95c	1,300	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 75 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	†12.00
Bos. dock No. 1 exp.	13.75-14.00
New Eng. del. No. 1	14.00
Buffalo, No. 1	14.25-14.75
Buffalo, No. 2	12.25-12.75
Chicago, No. 1	13.50-14.00
Chicago, auto, no alloy	12.25-12.75
Chicago, No. 2 auto	10.50-11.00
Cincinnati, dealers	11.25-11.75
Cleveland, No. 1	14.50-15.00
Cleveland, No. 2	13.50-14.00
Detroit, No. 1	11.00-11.50
Detroit, No. 2	10.00-10.50
Eastern Pa., No. 1	15.50-16.00
Eastern Pa., No. 2	13.50-14.00
Federal, Ill.	10.50-11.00
Granite City, R. R.	11.50-12.00
Granite City, No. 2	10.25-10.75
Los Angeles, No. 1	12.50-13.00
Los Angeles, No. 2	11.50-12.00
L. A., No. 1 f.a.s.	14.50-15.00
L. A., No. 2 f.a.s.	13.00-13.50
N. Y. dock No. 1 exp.	12.50
Pitts., No. 1 (R. R.)	16.50-17.00
Pittsburgh, No. 1	15.50-16.00
Pittsburgh, No. 2	14.00-14.50
St. Louis, R. R.	11.50-12.00
St. Louis, No. 2	10.25-10.75
San Francisco, No. 1	13.00-13.50
Seattle, No. 1	11.00-12.00
Toronto, dirs. No. 1.	9.25- 9.75
Valleys, No. 1	15.00-15.50

COMPRESSED SHEETS

Buffalo	12.25-12.75
Chicago, factory	12.50-13.00
Chicago, dealers	11.00-11.50
Cincinnati dealers	10.75-11.25
Cleveland	14.00-14.50
Detroit	12.00-12.50
E. Pa., new mat.	15.50-16.00
E. Pa., old mat.	12.00-12.50
Los Angeles	11.00-11.50
Pittsburgh	15.50-16.00
St. Louis	9.00- 9.50
Valleys	15.00-15.50

BUNDLED SHEETS

Buffalo, No. 1	12.75-13.25
Buffalo, No. 2	11.25-11.75
Cleveland	9.50-10.00
Los Angeles	14.00
Pittsburgh	14.00-14.50
St. Louis	7.00- 7.50
Toronto, dealers	8.00- 8.50

SHEET CLIPPINGS, LOOSE

Chicago	8.00- 8.50
Cincinnati, dealers	6.75- 7.25
Detroit	8.50- 9.00
†Los Angeles	3.75- 4.00
St. Louis	6.00- 6.50
Toronto, dealers	4.25- 4.75

BUSHELING

Buffalo, No. 1	12.25-12.75
Chicago, No. 1	12.25-12.75
Cincin., No. 1, deal.	7.00- 7.50
Cincinnati, No. 2	2.25- 2.75
Cleveland, No. 2	8.00- 8.50
Detroit, No. 1, new	10.75-11.25
Valleys, new, No. 1	14.25-14.75
Toronto, dealers	3.75- 4.25

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	6.25- 6.75
Chicago	7.00- 7.50
Cincinnati, dealers	4.50- 5.00
Cleveland, no alloy	7.50- 8.00
Detroit	5.75- 6.25
Eastern Pa.	9.00
Los Angeles	4.50- 5.00
New York	†3.50- 4.00
Pittsburgh	9.25- 9.75
St. Louis	4.50- 5.00
Toronto, dealers	4.25- 4.75
Valleys	9.50-10.00

SHOVELING TURNINGS

Buffalo	8.25- 8.75
Cleveland	7.50- 8.00
Chicago	7.00- 7.50
Chicago, spcl. anal.	8.00- 8.50
Detroit	6.75- 7.25
Pitts., alloy-free	11.00-11.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	3.35
Buffalo	7.25- 7.75
Cincinnati, dealers	3.25- 3.75
Cleveland	8.25- 8.75
Eastern Pa.	6.50- 7.00
Detroit	6.00- 6.50
New York	†2.50- 3.00
Pittsburgh	8.50- 9.00
Toronto, dealers	3.50- 4.00

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	13.50-14.00
East. Pa., elec. fur.	13.00-13.50
St. Louis	9.00- 9.50
Toronto	4.00- 4.25

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†4.50
Buffalo	7.25- 7.75
Chicago	6.50- 7.00
Cincinnati, dealers	3.25- 3.75
Cleveland	8.25- 8.75
Detroit	6.00- 6.50
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	2.50- 3.00
Toronto, dealers	3.75- 4.25

RAILROAD SPECIALTIES

Chicago	15.25-15.75

ANGLE BARS—STEEL

Chicago	15.25-15.75
St. Louis	13.00-13.50

SPRINGS

Buffalo	15.50-16.00
Chicago, coil	16.00-16.50
Chicago, leaf	15.00-15.50
Eastern Pa.	18.00
Pittsburgh	18.50-19.00
St. Louis	14.00-14.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	16.50-17.00
Chicago (3 ft.)	16.00-16.50
Chicago (2 ft.)	16.50-17.00
Cincinnati, dealers	17.50-18.00
Detroit	17.50-18.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	18.50-19.00
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	15.50-16.00
Chicago	13.50-14.00
Cleveland	16.50-17.00
Pittsburgh	16.50-17.00
St. Louis	13.00-13.50
Seattle	16.00

FROGS, SWITCHES

Chicago	13.50-14.00
St. Louis, cut	13.00-13.50

ARCH BARS, TRANSOMS

St. Louis	13.50-14.00

PIPE AND FLUES

Chicago, net	8.50- 9.00
Cincinnati, dealers	6.50- 7.00

RAILROAD GRATE BARS

Buffalo	9.00- 9.50
Chicago, net	7.50- 8.00
Cincinnati, dealers	6.25- 6.75
Eastern Pa.	13.00
New York	†8.50- 9.00
St. Louis	8.00- 8.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	16.00-16.50
St. Louis, No. 1	9.75-10.25
St. Louis, No. 2	11.50-12.00

FORGE FLASHINGS

Boston district	†7.50
Buffalo	12.25-12.75
Cleveland	11.00-11.50
Detroit	10.00-10.50
Los Angeles	9.00
Pittsburgh	14.00-14.50

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

LOW PHOSPHORUS

Cleveland, crops	17.50-18.00
Eastern Pa., crops	18.00-18.50
Pitts., billet, bloom, slab crops	19.00-19.50

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	15.50-16.00
Cleveland	15.00-15.50
Eastern Pa., crops	17.50-18.00
Pittsburgh	17.50-18.00
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.50-18.00
New York	†14.00-14.50
Eastern Pa.	17.00-17.50
St. Louis	16.00-16.50

STEEL CAR AXLES

Birmingham	†15.00-16.00
Boston district	†14.50
Chicago, net	17.00-17.50
Eastern Pa.	20.50-21.00
St. Louis	16.50-17.00

LOCOMOTIVE TIRES

Chicago (cut)	15.50-16.00
St. Louis, No. 1	12.25-12.75

SHAFTING

Boston district	†15.75-16.00
New York	†15.50-16.00
Eastern Pa.	20.50-21.00
St. Louis, 1¼-3¾".	15.50-16.00

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†10.00
Buffalo, steel	16.00-16.50
Chicago, iron	13.50-14.00
Chicago, rolled steel	14.50-15.00
Cincin., iron, deal.	13.00-13.50
Eastern Pa., iron	16.00-16.50
Eastern Pa., steel	18.00
Pittsburgh, iron	14.50-15.00
Pittsburgh, steel	18.50-19.00
St. Louis, iron	14.00-14.50
St. Louis, iron	14.00-14.50

NO. 1 CAST SCRAP

Birmingham	†13.00-13.50
Boston, No. 1 mach.	†11.00-11.50
N. Eng. del. No. 2	12.00-12.50
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	13.75-14.25
Buffalo, mach.	15.50-16.00
Chicago, agri. net	9.50-10.00
Chicago, auto net	12.50-13.00
Chicago, railroad net	11.00-11.50
Chicago, mach. net	12.00-12.50
Cincin., mach. deal.	12.00-12.50
Cleveland, mach.	17.00-17.50
Detroit, cupola, net	13.00-13.50
Eastern Pa., cupola	16.50-17.00
E. Pa., mixed yard	13.50-14.00
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	15.00-15.50
San Francisco, del.	13.50-14.00
Seattle	12.50-13.50
St. Louis, cupola	12.00-12.50
St. Louis, agri. mach.	14.00-14.50
St. L., No. 1 mach.	14.00-14.50
Toronto, No. 1, mach., net	12.00-12.50

HEAVY CAST

Boston dist. break	†9.50
New England, del.	12.50-13.00
Buffalo, break.	11.50-12.00
Cleveland, break, net	13.00-13.50
Detroit, auto net	13.00-13.50
Detroit, break	10.50-11.00
Eastern Pa.	15.50
Los Ang., auto, net.	13.50
New York, break.	†10.50-11.00
Pittsburgh, break	12.50-13.00

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	11.50-12.00
Chicago, net	7.75-8.25
Cincinnati, dealers	6.25- 6.75
Detroit, net	7.00- 7.50
Eastern Pa.	13.00
New York, fdy.	†10.00-10.50
St. Louis	7.50- 8.00
Toronto dealers, net	6.50- 7.00

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	11.50-12.50
Buffalo	14.00-14.50
Chicago, R. R.	15.00-15.50
Cincin., agri., deal.	10.75-11.25
Cleveland, rail	15.50-16.00
Eastern Pa., R. R.	16.00-17.00
Los Angeles	17.50-18.00
Pittsburgh, rail	15.75-16.25
St. Louis, R. R.	12.00-12.50

Iron Ore

Lake Superior Ore

Gross ton, 51½ %

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	12.00
Swedish low phos.	12.00
Spanish No. Africa basic, 50 to 60% nom.	11.00
Tungsten, short ton unit, duty pd. nom.	18.50-19.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nom.	29.00
So. African, 50-52% nom.	29.00
Indian, 49-50%	27.00-28.00

Sheets, Strip

Sheet & Strip Prices, Pages 60, 61

Pittsburgh—Flat-rolled steel releases and production are heavier. Automotive material is beginning to account for a fair share of current business, with miscellaneous orders also increasing. Sheet production is close to 60 per cent, against a 1938 high of 68 in December. Galvanized sheet output, responding to better demand, is up to 56. Most sheet production covers tonnage booked at May price cuts, but new orders are being taken at full prices.

Cleveland—Sheet and strip releases continue to gain, part being traceable to automotive needs. Heaviest demand is from miscellaneous consumers. While small lots predominate, a few large tonnages are included. Little new business is being placed, most shipments being against previous orders. This situation gives prices little test.

Chicago—Sheet and strip production is expanding. Demand is aided by growing releases from automotive interests as well as from miscellaneous consumers. Shipments to both groups are expected to increase further.

Boston—Buying is barely enough to test prices on new business. A few carlot orders are bringing listed prices, however. Most business is limited to specifications against old orders at lower prices, the bulk of which is being released in good volume. Narrow cold strip buying continues spotty for prompt delivery with aggregate tonnage maintained. Stainless strip demand is active, also sheets. Hot strip buying is light and rerolling operations are uneven.

New York—Prices continue firm on new business, though most specifications are against contracts. While releases are tapering, a fair tonnage still is being moved, particularly for household appliances. Building requirements are down somewhat. The 3000 tons of sheets required for pipe work at Harrisburg, Pa., is understood to be under protection.

Philadelphia—E. G. Budd Mfg. Co. now has a backlog of 49 stainless steel railroad passenger cars for which part of the stainless strip required still is pending. Preliminary runs have been made on 1940 auto bodies, and it is expected production of Chevrolet frames will get under way in about two weeks. Releases against old orders are coming in faster than was anticipated. New business is reported at full prices.

Cincinnati—Specifications are up sharply. Only part of the increase is attributed to expansion in automotive needs. Production is higher at about 60 per cent. Spot buying is fairly heavy despite recent heavy contracting, with prices reported firm on such business.

Birmingham, Ala. — Sheets remain most active product, demand being consistent although slightly lower, during the past few weeks. Operations are at about 80 per cent.

Bars

Bar Prices, Page 60

Pittsburgh — Quantity extras on hot-rolled carbon bars again have been revised, establishing the base quantity at 20 tons or over. Formerly it was 3 tons or over. This change, the third to be made in quantity differentials on bars this year, results in increases of $1 to $3 a ton in net prices on lots of less than 20 tons. In general, net prices on various sized orders now will be approximately the same as prior to the last previous revision in quantity differentials, May 15, taking into consideration a cut of $2 a ton in the base price at that time.

New extras are as follows: Under 20 to 10 tons, 5 cents; under 10 to 5 tons, 10 cents; under 5 to 3 tons, 15 cents; under 3 to 2 tons, 20 cents; under 2 to 1 ton, 35 cents. Small changes also were made in size, cutting, straightening and chemical extras.

Cleveland—Carbon and alloy bars are moving well despite restricted operations of the automotive industry. Some partsmakers, however, have increased releases. Demand elsewhere is widely scattered and better than a month ago. New quantity extras on hot-rolled carbon bars will have only limited application for the present, in view of tonnage already under contract under the old schedule.

Chicago—Carbon and alloy bar demand is heavier on expansion of miscellaneous requirements and automotive ordering. Steadiness in prices is encouraging to producers, with quotations tested by several large automotive purchases.

Boston—Commercial steel bar demand has improved slightly, notably jobber specifications. Orders for alloy bars continue numerous in small lots, the aggregate tonnage being steady for prompt shipment. Forward coverage is light. Mills are readjusting quantity extras on a 20-ton base for a size.

New York — Commercial bar demand is more active. Business still is spotty, but there is some quickening from automobile accessory and machinery interests. This is affecting cold-drawn and hot alloy bars particularly. Demand from government shops is sustained.

Philadelphia—Warehouses declare the new bar extras impose a hardship on them, since the price advance cannot be entirely passed on to consumers. Meanwhile, larger mill customers are fairly well covered for this quarter. Demand is mostly miscellaneous, with tool makers and forging shops principal buyers.

Birmingham, Ala. — Bars, especially for concrete reinforcing, have shown increase, especialy during the past two or three weeks. Highway and private construction account for most business.

Buffalo — Better automotive releases are reflected in further expansion in bar production, and with miscellaneous orders steady, rolling schedules are near the best level of the year.

Plates

Plate Prices, Page 60

Chicago — Business continues active, with some sellers reporting improved demand from miscellaneous fabricators. Prominent outlets include line pipe, tanks and other equipment for the petroleum industry. Prices are firmer.

Boston — Shading continues in medium black plate, despite lack of tonnage buying. Demand is spotty, with shipyard releases steady. Except for scattered carlot orders, shipments to fabricating shops are slack, the same applying to railroads. Specified work is also slow.

New York—Plate demand lagged badly during July, but there has been a better trend lately. Railroads are releasing slightly more material for equipment repairs, and specifications are cut for 150 to 300 cars for the municipal subway. Plate prices are becoming firmer, most sellers now quoting 2.29c, delivered.

Philadelphia — Miscellaneous demand is fairly steady but some large consumers, such as railroads, generally are absent from the market. Ship releases are limited to lots of several hundred tons at a time. The Chester, Pa., interest placed about 2000 tons two weeks ago. Prices are firmer.

Birmingham, Ala. — Plate demand continues surprisingly good, in absence of large orders. Considerable tonnage is going to Texas tank trade, and much tonnage has materialized from shipbuilding and miscellaneous construction.

Seattle—Largest project pending is the Mud Mountain dam, Washing-

ton state, 1400 tons ¾-inch plates for penstocks, bids at Seattle, Aug. 21. Awards are pending by reclamation bureau for two 96-inch outlets at Wickiup dam, Oreg., and 2660 feet of 10 to 36-inch metal pipe for the Boise project.

San Francisco — The largest plate letting in some weeks went to Western Pipe & Steel Co., 525 tons for a 42-inch welded steel pipe line for San Jose, Calif. Awards to date total 19,144 tons, compared with 17,207 tons for the same period a year ago.

Plate Contracts Placed

525 tons, 42-inch welded steel pipe, San Jose, Calif., to Western Pipe & Steel Co., San Francisco.

Plate Contracts Pending

2800 tons, 72-inch pressure line, Toledo, O., waterworks; Biggs Boiler Works Co., Akron, O., low.

175 tons, 250,000-gallon tank on 100-foot tower, state prison, Chino, Calif.; bids Aug. 1.

Pipe

Pipe Prices, Page 61

Pittsburgh — Pipe production is gaining slowly as a result of construction work and the better tonnage moving through consigned stocks to the merchant field. Oil country activity continues light, with the major interest still centered on the Illinois field.

Cleveland—Standard pipe demand is sustained, making a relatively better showing than oil country products. However, line pipe prospects are fair, with several projects pending. Proposal of General Gas Pipe Line Corp. for a 130-mile line in Kentucky and Indiana has been revived, and 22,000 tons will be required for a 438-mile oil line planned by a Standard Oil Co. subsidiary in Wyoming and Utah.

Boston—Slight improvement in merchant pipe demand is offset by widespread weakness in resale prices. Construction and industrial buying accounts for more activity, there being an absence of line pipe and tonnage inquiry. Cast pipe buying is steady, including several hundred tons for Salem, Stoughton, New Bedford, and Lunenberg, Mass., through the procurement division, treasury department, 288 tons of 8 and 10-inch being for the latter point. Utilities are buying little.

New York—Demand is fairly active, including several construction jobs. Sections now coming out for the municipal belt parkway development between Whitestone bridge and Rockaway will take 200 to 1000 tons of 10 to 18-inch pipe. Resale prices continue unsettled. Cast pipe business includes no large orders, but production holds well above the rate a year ago.

Birmingham, Ala. — Consistency of pipe production is one of the most gratifying developments. Considerable volume has materialized from the Pacific coast and points in Florida. Production is currently at five days a week, and inquiries are holding up well.

Seattle—Business is slow, few new inquiries developing. Spokane, Wash., has called bids Aug. 3 for furnishing about 250 tons of 6-inch bell and spigot cast iron, the following day bids to be opened at McChord Field, Washington, for 550 tons.

San Francisco — Bids have just been opened on the third largest inquiry of the year, 2490 tons of 6 and 8-inch pipe for Los Angeles. Bids open Aug. 7 for 100 tons of 6 and 8-inch pipe for Monrovia, Calif. Awards aggregated 958 tons, bringing the year's total to 18,385 tons as compared with 18,029 tons for the corresponding period in 1938.

Cast Pipe Pending

2490 tons, 6 and 8-inch, Los Angeles; bids opened.

250 tons, 6-inch bell and spigot, for Spokane, Wash.; bids Aug. 3.

118 tons, 6 and 8-inch, Walnut Park Mutual Water Co., Calif., bids opened.

100 tons, 6 and 8-inch, Monrovia, Calif.; bids Aug. 7.

Steel Pipe Pending

22,000 tons, pipe line for Utah Oil Refining Co., subsidiary of Standard Oil Co. of Indiana, between Fort Laramie, Wyo., and Salt Lake City, Utah. Includes 414 miles of 8-inch, 24 miles of 6-inch.

Wire

Wire Prices, Page 61

Cleveland—Business is fairly active despite a letdown for some items during July. Rods have moved better lately and nails have been stimulated slightly by approaching revisions in extras. However, the latter do not affect some sizes. Growing automotive needs are reflected indirectly in some wire business, although direct shipments still are moderate.

Chicago—Demand for manufacturers' wire is holding well, but a lull has appeared in merchant products. The latter situation is attributed to heavy buying in recent weeks. Automotive releases are heavier, although volume requirements will not be reached for another 30 days or so.

New York—Wire products are moving better than a month ago, and specifications for manufacturers' wire have improved, especially from furniture interests. Higher nail extras, effective Aug. 1, have stimulated demand for some sizes.

Philadelphia—Following weakness over an extended period, nail prices now are decidedly stronger, with 2.25c to jobbers and 2.40c to consumers well maintained.

Birmingham, Ala. — Virtually all wire products are moving at a generally satisfactory rate, nails and fencing especially. The mill here is maintaining its schedule without noticeable restocking on the part of jobbers and distributors.

Rails, Cars

Track Material Prices, Page 61

New York, New Haven & Hartford has placed 6000 tons of rails and about 600 tons of accessories, making a total of 15,000 tons of rails ordered by this road in 1939.

Wabash railway has been authorized by federal court to equip 50 automobile box cars with upper decks and other improvements and repairs for loading farm tractors. American Refrigerator Transit Co. will build 100 refrigerator cars in its St. Louis shops.

Chicago Rapid Transit Co., operating elevated railroads in that city, plans purchase of 1000 all-steel cars costing $25,000 each, over the next five years. One model car has been built for experimental use. Bids on 2570 tons of rails and a quantity of fastenings for relocation of Southern Pacific tracks at the Central Valley project in California will be opened July 31 by bureau of reclamation.

E. G. Budd Mfg. Co., Philadelphia, has booked three additional stainless steel coaches for Seaboard Air Line and now has a backlog of 49 cars to be built of this material.

Interstate commerce commission has granted permission to American Car and Foundry Co. to build ten 8000-gallon petroleum tank cars by fusion welding process for experimental purposes, in addition to 15 similar cars for which permission was given in February.

Locomotives Pending

Navy, 50-ton diesel electric locomotive; Atlas Car & Mfg. Co., low bidder.

Car Orders Placed

American Car & Foundry Co., ten 8000-gallon petroleum tank cars by fusion

welding, for experimental purposes; in addition to 15 let in February.

American Refrigerator Transit Co., 100 refrigerator cars, to own shops at St. Louis.

Seaboard Air Line, three additional stainless steel coaches, to Edward G. Budd Mfg. Co., Philadelphia.

Rail Orders Placed

New York, New Haven & Hartford, 6000 tons to Carnegie-Illinois Steel Corp.; also 600 tons of accessories, distributed among several sellers.

Car Orders Pending

New York, New Haven & Hartford, 25 caboose cars, contemplated.

Shapes

Structural Shape Prices, Page 60

Pittsburgh — Shapes continue active, despite decline in number of new private projects the past two weeks. Numerous jobs of this type are pending, although new inquiries are dominated by public works.

Chicago — Structural demand is good, although new inquiries are not impressive. Projects involving less than 100 tons are giving considerable support. Except for heavy requirements still pending for the local subway, the largest of recent inquiries is 2800 tons for two California bridges.

Boston—Pending active structural tonnage is the smallest in weeks, under 3000 tons. An insurance building, Boston, will take 6500 tons, to be placed when final plans are adopted. Bridge needs are estimated at around 500 tons, all small spans. Plain material prices are steadier.

New York—Local structural buying is featured by placing of 2210 tons for Mill Basin bridge, Brooklyn, with Bethlehem Steel Co., which also closed on 160 tons for a shore parkway development, in Brooklyn. Another outstanding award involves 1365 for the airways terminal, Pershing Square, placed with Lehigh Structural Steel Co., Allentown, Pa.

Shipments of fabricated shapes in June were the largest for any month in the past two years, according to reports to the American Institute of Steel Construction. June shipments were 128,395 tons, compared with a monthly average this year of about 111,000 tons. New orders booked in June were the largest this year except for April and May.

Philadelphia—A lull has appeared in structural inquiries, but considerable tonnage still is pending. Girard estate, Philadelphia, plans a large business structure at Eleventh and Chestnut streets, costing $1,500,000.

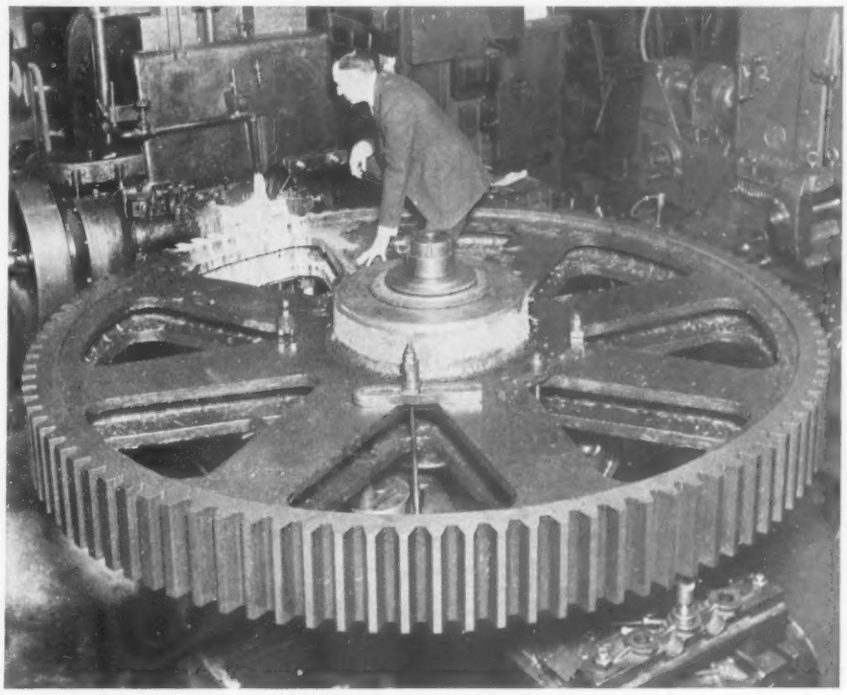
Buffalo—New projects are fewer, but unfilled orders of fabricators are the heaviest in more than two years. Except for a few bridges, most larger jobs have been cleared from the calendar for the time being.

Seattle — Inquiry for shapes is slow and no outstanding projects are up. Local shops have taken

Shape Awards Compared

	Tons
Week ended July 29	23,176
Week ended July 22	27,937
Week ended July 15	22,858
This week, 1938	12,375
Weekly average, year, 1938	21,568
Weekly average, 1939	22,590
Weekly average, June	17,590
Total to date, 1938	486,249
Total to date, 1939	677,693

Includes awards of 100 tons or more.



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several small jobs, each less than 100 tons. Contractors are interested in the $400,000 power plant building at Pearl Harbor for navy department, bids at Washington, Aug. 30, tonnages unstated.

San Francisco — While awards totaled only 892 tons, bringing the year's aggregate to 71,975 tons, compared with 71,697 tons a year ago, a number of new inquiries have appeared. Outstanding are 1700 tons for the Salt Creek bridge and 1200 tons for the O'Brien Creek bridge on the Central Valley project in California.

Birmingham, Ala. — Mill interests describe shape tonnage this week as fair. Public projects are taking much of the tonnage.

Shape Contracts Placed

9400 tons, superstructure, New Jersey state bridge, over Raritan river, to Bethlehem Steel Co., Bethlehem, Pa.

2400 tons, Mill basin bridge MS-39-3-C, Brooklyn, N. Y., for city of New York, to Bethlehem Steel Co., Bethlehem, Pa.

1410 tons, four buildings, Aluminum Co. of America, Alcoa, Tenn., to Ingalls Iron Works, Birmingham, Ala.

1000 tons, paint and loading shop, for Chicago Bridge & Iron Co., Chicago, to American Bridge Co., Pittsburgh.

700 tons, raw materials and assembly building, for Western - Austin Co., Aurora, Ill., to Hansell-Elcock Co., Chicago.

600 tons, addition to public school 67, Brooklyn, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

555 tons, bridge W-311-643, Hagerstown, Md., to American Bridge Co., Pittsburgh.

500 tons, bridge, Maryland, Okla., to Kansas City Structural Steel Co., Kansas City, Kans.

400 tons, state bridges, FAS-SS-39-2, Esperence, N. Y., to Lackawanna Steel Construction Corp., Buffalo, N. Y.

370 tons, Roundout creek bridge, contract 341, Wawarsing, N. Y., to American Bridge Co., Pittsburgh.

370 tons, state bridges, route 6, section 11-A, Bloomfield, N. J., to American Bridge Co., Pittsburgh.

365 tons, freight car handling crane, Texas City, Tex., for Seatrain Lines Inc., to American Bridge Co., Pittsburgh.

360 tons, contract MS397, shore parkway, Kings county, New York, to American Bridge Co., Pittsburgh, through Reiss & Weinsier, general contractor.

328 tons, eight slide gates, Hansen dam, Los Angeles, for United States engineer office, to Consolidated Steel Corp., Los Angeles.

327 tons, bridge, Paul's Valley, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

325 tons, bridge, Pendelton county, Kentucky, to Midland Structural Steel Co., Cicero, Ill.

276 tons, bridge, Maryland, Okla., to Capital Iron Works, Topeka, Kans.

270 tons, double swing highway bridge, Coinjock, N. C., to Virginia Bridge Co., Roanoke, Va.

260 tons, warehouse, American Smelting & Refining Co., Perth Amboy, N. J., to Belmont Iron Works, Philadelphia.

225 tons, bridge, Hopkins street, Buffalo, N. Y., to Bethlehem Steel Corp., Bethlehem, Pa.

225 tons, grain elevator, Chicago, to Gage Structural Steel Co., Chicago.

210 tons, alteration, Sixty-third street line, Chicago, to Hansell-Elcock Co., Chicago.

205 tons, Bedford dwellings, Pittsburgh, to American Bridge Co., Pittsburgh.

200 tons, state bridge, route 12, East St. Louis, Ill., to Bethlehem Steel Corp., Bethlehem, Pa.

200 tons, bridge No. 5475, Houston county, Minnesota, to Lakeside Bridge & Steel Co., Milwaukee, Wis.

175 tons, clinker storage bins, Permante Cement Corp., Los Gatos, Calif., to Bethlehem Steel Co., San Francisco.

175 tons, underpass, route 4, section 40, Gordon's Corner, N. J., to American Bridge Co., Pittsburgh.

160 tons, shore parkway, contract NS-39-14A, Brooklyn, to Bethlehem Steel Co., Bethlehem, Pa.

155 tons, bridge FAGS-81A, Hutchinson county, Texas, Amarillo Bridge Co.

150 tons, city of Chicago office and garage building, to A. F. Anderson Iron Works, Chicago.

150 tons, junior fair building and grandstand, for Delaware county, Delaware, O., to C. E. Morris Co., Columbus, O.

135 tons, state underpass, Ninth street, Bismarck, N. Dak., to American Bridge Co., Pittsburgh.

125 tons, Northern Pacific Railway Co., 125-foot turntable, Laurel, Ill., to Wisconsin Bridge & Iron Co., Milwaukee.

125 tons, Detroit Gasket & Mfg. Co., plant addition, Marine City, Mich., to Whitehead & Kales Co., Detroit.

120 tons, tunnel supports, Muir, Calif., for Atchison, Topeka & Santa Fe railroad, to Consolidated Steel Corp., Los Angeles.

115 tons, incinerator, Dayton, Ohio, to Burger Iron Works, Akron, O.

110 tons, bridge, between Laurel and Jackson counties, Kentucky, to Midland Structural Steel Co., Cicero, Ill.

Shape Contracts Pending

6500 tons, building, New England Mutual Insurance Co., Boston; Turner Construction Co., Boston, general contractor.

2800 tons, two bridges, bureau of reclamation, Delta, Calif.; bids Aug. 7.

1700 tons, Salt Creek bridge, specification 862, Central Valley project, California; bids Aug. 7.

1600 tons, grade crossing elimination, aqueduct, Long Island, N. Y., for Long Island railroad.

1500 tons, two bridges at Scotia, Calif.; bids soon.

1386 tons, piling, improvement Los Angeles river channel, Los Angeles, for United States engineer office, Los Angeles; bids Aug. 14.

1200 tons, O'Brien Creek bridge, specification 862, Central Valley project, California; bids Aug. 7.

1100 tons, grade separation, Pere Marquette railway, Blanc, Mich., for state.

1000 tons, including castings, three dams, Knightsville, Mass., Surrey Mt., N. H. and Franklin, N. H.

900 tons, 11-story office building, Sacramento, Calif.; bids soon.

900 tons, grade separation, Seventh and Magnolia streets, Louisville, Ky., for state.

600 tons, underground headquarters buildings for water and power department, Los Angeles; Bethlehem Steel Co. low.

560 tons, turnpike work, Cumberland county, Pennsylvania, sections 19 and 20; John N. Savage, Lancaster, Pa., low on general contract.

400 tons, also 600 tons reinforcing bars, building for Continental American Life Insurance Co., Wilmington, Del.; Turner Construction Co., Philadelphia, general contractor.

350 tons, apartment building, for J. R. K. Scott, Cynwyd, Pa.

325 tons, industries building No. 3, Lewisburg, Pa., for Federal Prison Industries Inc.

324 tons, miscellaneous structural steel, city of Chicago; bids Aug. 4.

320 tons, state highway bridge, Ontonagon, Mich.; bids in.

300 tons, maintenance building, for Rochester Gas & Electric Co., Rochester, N. Y.

250 tons, radial gates, Hiawassee dam, Tennessee, for Tennessee Valley authority.

225 tons, completion of hangars 1, 2, 3 and 4, Ft. Lewis, Wash., for U. S. army.

220 tons, bridge, section 14-A, route 39, Bedford county, for Pennsylvania turnpike commission.

208 tons, bridge over Santa Ana River in San Bernardino county, Calif., for state; bids opened.

200 tons, state bridge over Seven Mill brook, Vassalboro, Me.

200 tons, machine shop, Newark, N. J., for American Can Co.

175 tons, state highway bridge, Stratford, Conn.

175 tons, state bridges, Villisca and Charles City, Iowa.

175 tons, recreation building, Elizabethport, N. J., for Singer Mfg. Co.

150 tons, post office York, Pa.; bids Aug. 18; includes 75 tons reinforcing bars.

150 tons, Brownell elementary school, Chicago; bids Aug. 1.

140 tons, building, for H. L. Green Co., Harrisburg, Pa.

135 tons, state bridge RC-4019, Minoa, N. Y.

130 tons, buildings, Hawthornden hospital, Macedonia, O., for state.

120 tons, state bridge, Fife Lake, Mich.

Tin Plate

Tin Plate Prices, Page 60

Tin plate production holds at 65 per cent, but specifications are tending downward and there is some question whether operations will be maintained long at this pace. Stocks in producers' hands are not regarded too heavy considering the volume of shipments. Export buying is sustained.

Reinforcing

Reinforcing Bar Prices, Page 61

Pittsburgh—Awards and inquiries continue in good volume. Prices are steadier, with few jobs going at less than 1.80c base. The nominal 2.05c base generally has been abandoned, most tonnage being priced at 1.80c to 1.95c. Following the recent elimination of plain bars from the concrete bar card, some attempt to clarify further and stabilize the highly irregular price situation that has prevailed this year is looked for shortly.

Chicago—Bids on section D-1 of the Chicago subway, taking 2650 tons of bars, have been extended from July 27 to Aug. 3. New bids also will be asked on section S-6, involving 3700 tons. Awards include 655 tons for six Illinois bridges.

Boston—Close to 2500 tons for the New England Mutual Insurance Co., building, Boston, is the outstanding reinforcing steel purchase. Prices are slightly steadier. Three dam projects in New England take 1400 tons. Small lot buying predominates.

New York — Bids have been opened on 3000 tons for the Lackawack dam for the New York board of water supply, with Mason & Hanger low on the general contract. Awards are light.

Philadelphia — A life insurance building at Wilmington, Del., will take 600 tons of bars, and several pending Pennsylvania turnpike jobs will take a few hundred tons each. Several hundred tons have been placed for a Trenton, N. J., housing project, but the Philadelphia housing development still is pending. Prices continue depressed.

Seattle—Inquiry is slow, only large project up for figures being the Mud Mountain dam, Washington state, revised specifications increasing reinforcing from 1350 to 1400 tons, bids to United States engineer, Seattle, Aug. 21. Several Washington state road jobs and contracts for reclamation bureau, totaling about 1000 tons, are unplaced, bids being in for 668 tons for irrigation projects at Roza and Boise.

San Francisco — Some improvement in demand and awards for reinforcing steel bars is noted and lettings aggregated 4275 tons, bringing the total to date to 93,726 tons, compared with 65,972 tons for the corresponding period in 1938. Bethlehem Steel Co. secured 1485 tons for barracks for the Alameda, Calif., naval air base and Soule Steel Co. took 1231 tons for additions to the new plant for the Permante Cement Corp., Los Gatos, Calif., and 103 tons for the Horace Mann junior high school, San Francisco.

Concrete Bars Compared

	Tons
Week ended July 29	11,475
Week ended July 22	7,529
Week ended July 15	6,473
This week, 1938	6,753
Weekly average, year, 1938	6,959
Weekly average, 1939	9,926
Weekly average, June	10,667
Total to date, 1938	171,436
Total to date, 1939	297,774

Includes awards of 100 tons or more.

Reinforcing Steel Awards

2500 tons, building, New England Insurance Mutual Co., Boston, to Bethlehem Steel Co., Bethlehem, Pa.; Turner Construction Co., Boston, general contractor.

1485 tons, barracks at naval air base station, Alameda, Calif., to Bethlehem Steel Co., San Francisco.

1231 tons, additions to plant of Perm-

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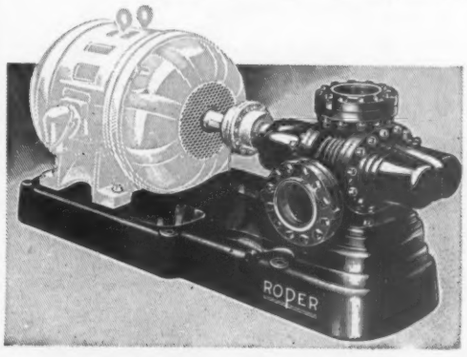

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The Bitter End

■ In a nearby town a newspaper friend recently resigned to go into business for himself. With keen regret he wrote a moving little message to the rest of the staff (single-spaced) and posted it on the bulletin board. The city editor hated as much as anyone to see him go but he hesitated only a moment before he stomped over to the bulletin board and scrawled across the top in typical city editor fashion: "In future all farewell notes must be double-spaced!"

Chickens Galore

■ This week, if it's the last thing we ever do, we're determined to find out which came first, the chicken or the egg. Swarming in (and that's the only word for it) from every state in the union and from 44 foreign countries all over the world, are a quarter of a million panting visitors to the World's Poultry Congress being held this week in Cleveland. Some of the statistics on this gathering can easily knock you for a loop these hot days. This is the first time *l'affaire chicken* has ever been held in the United States and it is billed as the world's largest convention. Being a doubting Thomas we called headquarters to check up and found that 175,000 tickets had been sold *in advance* for one buck apiece. Plans for housing this wholesale immigration of poultry lovers have been checked and re-checked now for a year and a half. With hotels and private accommodations bulging, open air camping grounds have been provided in several small suburban towns with daily commuting busses to and from the exhibition grounds on the downtown lakefront. 1500 passenger pigeons were let fly while we're writing this to get things under way and for the next ten days over 15,000 fowl of one breed or another will be on display. We understand, confidentially, that some good old-fashioned cock fights were sneaked into the schedule of events but dropped at the last minute by request of the A. S. P. C. A. If you have any salesmen making Cleveland this week they'll probably come home to roost with a cackle on their lips.

Another Mr. Babbitt

■ Have you ever seen the circulars distributed to "our friends and customers" by the Carbonite Metal Corp., Chicago, Ill.? If not, drop L. D. Staplin a line and ask him to send you the latest one. Along with the current prices of babbitt and bearing metals (which seem slightly incidental) you will get some most excellent private opinion on such a variety of subjects as machine politics, the future of the Jew, executive thinking, communism, sex and labor unions.

Flying Cousin

■ Passing one of the small town airports over in Pennsylvania last week we spotted a Piper Cub beside the hangar with the name "Lill Shrdlu" painted on the side. A bit of private detecting uncovered the pilot and owner at the airport tap room, a very snappy looking gal, traveling the country selling women's hose. Over a short beer we had little trouble tracing our family trees back to the same black sheep uncle, ol' Sloppy Joe Shrdlu of Leavenworth. Kan.

SHRDLU

ante Cement Co., Los Gatos, Calif., to Soule Steel Co., San Francisco .

760 tons, Delaware hospital, Wilmington, Del., to Bethlehem Steel Co., Bethlehem, Pa.

572 tons, Colorado avenue underpass, Santa Monica, Calif., to unnamed interest.

530 tons, housing project, Trenton, N. J., to Sweets Steel Co., through Karno Smith Co., Trenton, N. J.

500 tons, diversion sewers, section 2, Rock creek, Washington, to Truscon Steel Co., Youngstown, O.; Joseph Lombardi, Philadelphia, contractor.

500 tons, Men's Union building, Minneapolis, to Concrete Steel Co., New York.

500 tons, reformatory, Elmira, N. Y., to Reecon Steel Co.; C. F. Haglin & Sons, Buffalo, N. Y., contractors.

375 tons, highway work near Wilmington, Del., to Taylor-Davis Inc., Philadelphia.

300 tons, high school, Rochester, Minn., to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, county hospital and power house, Waldo, Mich., to Ceco Steel Products Corp., Omaha, Nebr.

252 tons, two bridges, Whiteside county, Ill., to Calumet Co., Chicago.

250 tons, hospital, Franciscan Sisters, Santa Maria, Calif., to unnamed interest.

230 tons, superstructure, Plumb Beach channel bridge, Brooklyn, N. Y., to Concrete Steel Co., New York; Mill Basin Asphalt Corp., contractor.

200 tons, paving and bridge, route 220, Pike county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.; F. D. Kessler, contractor.

150 tons, state highway project 57, Akron, O., to Pollak Steel Co., Cincinnati; C. B. Moon, contractor.

119 tons, bureau of reclamation, Invit. 38,341-A, Leavenworth, Wash., to Bethlehem Steel Co., Seattle, Wash.

110 tons, section 8C1 and 9A1, Pennsylvania turnpike, Somerset county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.; H. R. Dickens, Philadelphia, contractor.

108 tons, section 19D, Pennsylvania turnpike, Cumberland county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.; Walker Bros., contractors.

103 tons, Horace Mann junior high school, San Francisco, to Soule Steel Co., San Francisco.

100 tons, bridges, route 6, Morris county, New Jersey, to Concrete Steel Co., New York; Eisenberg Construction Co., contractor.

100 tons, music building, Normal school, Fredonia, N. Y., to Buffalo Steel Co., Tonawanda, N. Y.; Sessinghans & Ostergaard, Erie, Pa., contractor.

100 tons, theater and store, Inglewood, Calif., to unnamed interest.

100 tons, warehouse, Ducommun Metals & Supply Co., Vernon, Calif., to unnamed interest.

Reinforcing Steel Pending

4000 tons, ten miles reinforced concrete pipe for metropolitan water district, Salt Lake City, Utah; bids July 31.

2900 tons, Ida B. Wells housing project, Chicago; Thompson-Starrett Co., New York, low on general contract.

2788 tons and 650 tons wire mesh, improvement Los Angeles river channel, Los Angeles, for United States engineer office; bids Aug. 14.

1400 tons, Mud Mountain dam, Washington state; bids to U. S. engineer,

Seattle, Aug. 21.

1100 tons, sewage plant, Ft. Wayne, Ind.; bids July 31.

1000 tons, dam, Franklin, N. H., bids Aug. 9.

775 tons, belt parkway bridge, contract MS393, Kings county, New York, J. P. Carlin Construction Corp., low on general contract.

507 tons, piers for New Jersey state bridge over Raritan river, Route 53, section 14.

500 tons, addition to Fisk street station, Commonwealth Edison Co., Chicago; George Fuller Co., Chicago, general contractor.

500 tons, housing project, Covington, Ky., H. B. Deal, St. Louis, contractor.

483 tons, Abraham Lincoln school, San Francisco; bids opened.

405 tons, power plant drop No. 3, Imperial Irrigation District, El Centro, Calif.; Chas. W. Pettifer, 703 West Fourteenth street, Los Angeles, low on general contract at $308,466.

403 tons, four bridges, Winnetka, Ill.; Suburban Paving & Improvement Co., Chicago, general contractor.

380 tons, clinker storage bins, Permante Cement Co., Los Gatos, Calif.; bids opened.

350 tons, Miller vocational school, Minneapolis.

340 tons, section 14A, Pennsylvania turnpike, Bedford county, Pennsylvania; bids July 27.

300 tons, viaduct, Cranston Heights, Del., J. A. Bader, Wilmington, Del., low bidder.

300 tons, sewage plant, Manitowoc, Wis.

270 tons, holding canals Leavenworth, Wash., fish hatchery project; Norris Bros., Burlington, Wash., general contractor; materials furnished by reclamation bureau.

268 tons, Payette division, Boise, Idaho, project; Henry L. Horn, Caldwell, low; materials furnished by reclamation bureau.

250 tons, Sideling Hill tunnel ventilation, Fulton county, Pennsylvania; Ritter Bros., Harrisburg, Pa., low bidder.

205 tons, bridge in Ventura county, Calif., for state; bids opened.

204 tons, reservoir and pump house, city water works, Pekin, Ill., bids in.

200 tons, Middle creek storage building, Bozeman, Mont.

200 tons, six bridges in Lassen county, California, for state; bids opened.

162 tons, steam plants for Pacific Gas & Electric Co. at Avon and Martinez, Calif.; bids opened.

100 tons, slurry tanks for Permante Cement Co., Los Gatos, Calif.; bids opened.

100 tons, post office, East Los Angeles; bids opened.

100 tons, baking plant, Los Angeles, for Helm's Bakeries; bids being taken.

100 tons, slaughter house for Carstens Packing Co., Tacoma, Wash.; bids opened July 27.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 61

Another price increase to distributors of bolts and nuts has been announced, effective Aug. 1. No change has been made in consumer prices. The new schedule for distributors represents an advance of 9 to 11 per cent and restores prices to the April level. It is to apply through the remainder of this quarter. This is the second price advance since the June reduction. Resellers covered rather heavily last month, but with consumer buying fairly active July business compared favorably with June.

Ferroalloys

Ferroalloy Prices, Page 62

Ferromanganese shipments are about on parity with June. Prices are unchanged and little imported material is being received.

Pig Iron

Pig Iron Prices, Page 62

Pittsburgh — Shipments and new orders are heavier, though volume still is light. Foundry operations continue to lag, but demand from nonintegrated mills has increased. Some low-price contracts remain to be completed, while new business at the current market is expanding. Coke prices are stronger, with shipments heavier.

Cleveland—A decline of about 10

Protect Your Workers with
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Heat-Fag and hot weather travel together. You can't stop the weather — but, you *can protect your workers against Heat-Fag* and stop the sag in the production line by placing Morton's Salt Tablets at every drinking fountain. These handy little tablets represent the easiest and most convenient way to replace the vitally needed body salt that's sweated out by hard work on hot days.

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MORTON SALT COMPANY CHICAGO, ILLINOIS

per cent in July shipments is expected to be temporary in view of improvement in orders and a more favorable outlook among some consumers. Foundries show less tendency than formerly to confine releases to immedate needs. Heavier production of automotive castings is in early prospect.

Chicago—July shipments are 5 to 10 per cent ahead of June. Further improvement is seen for August, chiefly because of improved automotive requirements. Recent gains have been attributed almost entirely to general demand, although agricultural equipment requirements came back stronger near the end of the month. Firm price of $21 prevails. Sellers say it is still too early to consider price changes for fourth quarter. Coke shipments during July show no variation from those of June.

Boston—Buying is in small lots. Consumption is steady, with some scattered gains. Coke releases are spotty and light. Coke and iron prices are firm.

New York — Specifications are up slightly but still small. Machine tool builders and soil pipe makers are taking more tonnage. Prices are stronger, sellers showing unwillingness to accept additional tonnage on old contracts made under the current market. Some sellers already are discussing possibility of an advance next quarter.

Philadelphia — July shipments compared favorably with June's. New business generally is light, but some large orders have been placed lately by a malleable interest and a steel casting firm. Textile equipment makers are busy and stove foundries are fairly active. Pressure pipe plants are operating at 60 per cent and soil pipe makers at 45. Prices are firm, with export quotations stronger.

Buffalo—Merchant iron demand is about the same as a month ago, but a spurt in open-hearth operations has been followed by blowing in an additional blast furnace by Bethlehem Steel Co. Nine of the district's 14 stacks now are active, best rate in about a year.

Cincinnati—Deliveries show little change since June, although automotive parts producers expect better operations soon. Output of machine tool castings is steady and active. New pig iron buying is spotty.

Birmingham, Ala. — Pig iron producers remain optimistic as to prospects for better business. Merchant iron is in fairly good but spotty demand and steel interests have quickened production considerably.

Toronto, Ont. — Demand is quiet, with business usually in lots of 50 to 100 tons. Most melters are out of the market. A local pipe foundry recently resumed operations, and better demand also is appearing from radiator makers.

Imports Are Light

Philadelphia—Imports during the week ended July 22 included 100.7 tons of pig iron from Holland and 30 tons of chrome ore from India. These were valued at $1873 and $385, respectively.

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HANNA
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. . . foundrymen have recognized Hanna quality as a standard for comparison. Such a reputation is especially significant today, when close adherence to specifications is so important.
NATIONAL STEEL

THE HANNA FURNACE CORPORATION
MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION
Buffalo Detroit New York Philadelphia Boston

Scrap

Scrap Prices, Page 64

Pittsburgh — Prices are firm in the face of limited new business. Most activity is against orders. Demand for open-hearth grades in adjacent districts is helping maintain quotations here, No. 1 steel continuing $15.50 to $16. Railroad specialties continue strong and in light supply. Malleable scrap is firmer.

Cleveland — Steelmaking scrap is increasingly scarce at prevailing prices and dealers are limiting sales. Melters are not pressing and the market is quiet but strong. Quotations are unchanged but a rise seems imminent.

Chicago — Prices are unchanged and the market is rather quiet, although some No. 1 steel is moving within the quoted range of $13.50 to $14. Brokers are paying $14 generally for tonnages, but some claim smaller lots are available at $13.75. Prices of some grades are nominal, but a strong tone generally prevails.

Boston — Prices are firmer on a limited volume of domestic business. Buying of foundry grades is spotty and district steelworks are taking only scattered shipments. Busheling is bringing $8.15 f.o.b. here, with machine turnings moving to eastern Pennsylvania at $3.38. Export prices are firm.

Philadelphia—The market is buoyant, with prices of several grades following the recent upturn in heavy melting steel. Heavy steelmaking scrap is quiet in new business, but turnings, stove plate, grate bars and cast grades are moving fairly well. Japan is expected to place considerable tonnage the next few months in view of the threatened embargo. Export prices are steady. Luria Bros. & Co. Inc. has purchased the Reading and Danville plants of Reading Iron Co., involving about 16,000 tons of material. Part of it will be salvaged. E. G. Budd Mfg. Co.'s August scrap list totals 2000 tons, against 1200 in July.

Buffalo—Scrap is more active and prices are higher. One mill bought about 8000 tons of steelmaking grades at 25 cents above the recent market and $1.50 higher than its last purchasing price. No. 1 steel now is $14.25 to $14.75. Exporters still are absorbing scrap from nearby districts, but higher prices are stimulating offerings.

Detroit—Scrap trading is light, although outside buying is drawing some material from local sources. Small offerings by auto plants are strengthening prices and practically the entire list has moved up for the second time within the past two

weeks. Mill buying here is not expected in volume before Sept. 1.

Cincinnati — Scrap prices are strong but unchanged. Mill buying is light, but dealers are accumulating some scrap in anticipation of better demand shortly, since steelmaking at present is depressed artificially.

St. Louis — The market is strong. Inquiries are more active and better buying is in prospect in view of decline in consumer stocks. Offerings are light and dealers' supplies are below normal. No. 2 steel and cast scrap are higher on a recent purchase by a local mill.

Seattle—Japan is buying sparingly. Loading is undisturbed at American ports, but at Nanaimo, B. C., picketing caused diversion of 200 tons of export materials. Scrapping of sawmill plants and logging railroads is giving dealers increased supplies. Local mills continue to buy at $11.50 and $12.50, export prices steady at $12.50 and $13.50.

Toronto, Ont. — Business is spotty and generally quiet. Heavy melting steel is moving steadily to Hamilton mills, and foundries have bought fairly large lots of machinery cast. Low prices restrict offerings, but consumers decline to increase bids on new contracts.

Warehouse

Warehouse Prices, Page 63

Pittsburgh — Business has improved in recent weeks. Prices have steadied, although some weakness continues. Bars show the best activity.

Cleveland—Possibility is seen of a price advance on hot-rolled carbon bars as a result of higher mill quantity extras on small lots. Business generally is off moderately this month. Alloy bar demand is fairly steady.

Chicago—July will show little change from the June volume, a favorable record in view of the holiday interruption. A steady trend is indicated for August.

New York—Warehouses are following nail producers in revising extras, effective Aug. 1. Miscellaneous business is fairly steady, though orders are small. July is expected to show a small decrease from June.

Buffalo—Warehouses are encouraged by July sales, variations from June being slight. Specialties and sheets are moving better.

Philadelphia — Business declined the second half of July, reducing the month's total somewhat below June. Some price revision is expected in cold-finished bars on lots under 300 pounds. Galvanized sheets are weak.

Cincinnati—Sales are well sustained near levels of recent months, with no seasonal lull evident in the industrial or coal mining demand.

Seattle—Volume of sales is slightly ahead of last month but the market shows signs of seasonal dullness. Sheets and light plates continue to lead, but in small tonnages. The local price situation is improved under a higher schedule but is still below levels being maintained at Portland.

Steel in Europe

Foreign Steel Prices, Page 63

London — (*By Cable*) — Hematite pig iron stocks in Great Britain are decreasing as users take larger deliveries. A heavy tonnage of Australian sheet bars has been unloaded at Middlesbrough this week, the largest cargo of semifinished steel ever imported. Tees side shipbuilding demands are increasing. Steel output is being maintained at a high level.

The Continent reports revival of demand for merchant bars in the Far East and for bars and shapes to Holland and Scandinavia. Scrap prices are firmer.

Nonferrous Metals

New York — Split markets ruled in copper and zinc last week as some sellers were reluctant to move to higher levels. Display of strength follows steady improvement in consumption and sales as new evidence accumulates that outlook for nonferrous metals is brighter. Hesitancy in moving to higher levels was due primarily to uncertainty as to the ability of the London market to hold its recent price gains and, in the case of zinc, to the effect on ore prices and tariff negotiations in Washington.

Copper—Electrolytic was available from custom smelters at 10.25c, Connecticut, while mine producers quoted 10.37½c on which drawn and rolled product prices were based. Export copper sold up to 10.40c, c.i.f. European base ports late in the week following resumption of buying by Japan against the possibility of an embargo.

Lead—Business continued active, especially following the opening of September books. Deliveries are being requested sooner than had been scheduled, indicating a substantial cut in refined stocks. Prices held at 4.70c, East St. Louis.

Tin—Buffer pool tightened its hold

AT THE HEART

. . . and in the heart . . .

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Small wonder that Clevelanders prefer the Cleveland, and experienced travelers warmly agree with them.

HOTEL CLEVELAND *Cleveland*

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound.

July	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
22	10.25	10.37½	9.87½	48.50	48.25	4.85	4.70	4.50	20.00	12.00	35.00
24	10.25	10.37½	9.87½	48.45	48.25	4.85	4.70	4.50	20.00	12.00	35.00
25	10.25	10.37½	9.87½	48.45	48.20	4.85	4.70	4.50	20.00	12.00	35.00
26	10.25	10.37½	9.87½	48.45	48.20	4.85	4.70	4.50	20.00	12.00	35.00
27	10.25	10.37½	9.87½	48.45	48.25	4.85	4.70	4.50	20.00	12.00	35.00
28	10.25	10.37½	9.87½	48.40	48.20	4.85	4.70	4.60	20.00	12.00	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 10.37½c Conn. copper

Sheets

Yellow brass (high)	16.73
Copper, hot rolled	18.50
Lead, cut to jobbers	8.00
Zinc, 100 lb. base	9.75

Tubes

High yellow brass	19.48
Seamless copper	19.00

Rods

High yellow brass	12.08
Copper, hot rolled	15.00

Anodes

Copper, untrimmed	15.75

Wire

Yellow brass (high)	16.98

OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass

New York	6.00-6.25
Cleveland	6.75-7.00
Chicago	6.12½-6.37½
St. Louis	6.25-6.50

Heavy Copper and Wire

New York, No. 1	8.00-8.12
Cleveland, No. 1	7.75-8.00
Chicago, No. 1	7.75-8.00
St. Louis	7.75-8.00

Composition Brass Turnings

New York	5.25-5.50

Light Copper

New York	6.50-6.75
Cleveland	6.00-6.25
Chicago	6.12½-6.37½
St. Louis	6.25-6.50

Light Brass

Cleveland	3.75-4.00
Chicago	4.12½-4.37½
St. Louis	3.75-4.00

Lead

New York	4.00-4.25
Cleveland	3.75-4.00
Chicago	3.66-3.85
St. Louis	3.50-3.75

Zinc

New York	2.50-2.62½
Cleveland	2.25-2.50
St. Louis	2.25-2.50

Aluminum

Borings, Cleveland	6.25-6.50
Mixed, cast, Cleveland	7.75-8.00
Clips, soft, Cleveland	14.75-15.00
Misc. cast, St. Louis	7.00-7.25

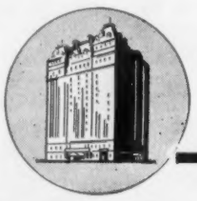
SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	10.50
Standard No. 12 aluminum	11.75-12.00

on the market as indicated by the fact that standard spot has held unchanged at £229 17s 6d since July 13. In view of the market steadiness consumers here covered only immediate requirements. Straits spot held at around 48.50c throughout the week.

Zinc—Offerings were tight with some bids at 4.60c turned down. Regular customers' needs were covered at a range of 4.50c to 4.60c, East St. Louis. The closing was at 4.60c.

Antimony—The market remained dull with prices unchanged at 12.00c, New York, for American spot in cases and nominally 14.00c, duty paid New York, for Chinese spot.



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BELLEVUE IN PHILADELPHIA

STRATFORD CLAUDE H. BENNETT *General Manager*

Activities of Steel Users, Makers

■ LINK-BELT CO., Chicago, has organized the Link-Belt Speeder Corp., 301 West Pershing road, Chicago, a wholly owned subsidiary, which will be operated independently for the manufacture and sale of power-operated excavating and materials handling shovels, draglines, cranes, including a full line of track-type locomotive cranes. This follows the announcement several months ago of the consolidation of Speeder Machinery Corp., Cedar Rapids, Iowa, and the shovel division of Link-Belt, which now become the Link-Belt Speeder Corp. Officers are: Chairman, Alfred Kauffmann; president, T. M. Deal; vice presidents, Walter Baker and W. C. Carter; treasurer and assistant secretary, H. E. Kellogg; secretary, G. H. Olson; assistant secretary, O. A. Prather; assistant treasurer, F. V. MacArthur.

♦

Baldwin-Southwark Corp., Philadelphia, has been awarded two 27,000-horsepower I. P. Morris hydraulic turbines, including governing mechanism, by the Lower Colorado River Authority. These turbines are for installation at Marshall Ford dam on the Colorado river in Texas.

♦

Power Piping division, Blaw-Knox Co., Pittsburgh, has appointed George P. Schumacker Co., Cleveland, its exclusive distributor in Ohio, for process and power piping. The Schumacker company specializes in engineering and sale of boiler house equipment and also maintains representation in Toledo, Columbus and Cincinnati.

♦

J. J. O'Connor, Gulf building, Pittsburgh, who recently was appointed with his associates as Pittsburgh district sales representative for the ingot brass and bronze products of George Birkenstein Corp., Chicago, STEEL, July 24, page 21, also continues as Pittsburgh representative, General Smelting Co., Philadelphia.

♦

Rome Machinery Sales & Engineering Co., Rome, N. Y., announces establishment of an organization to promote the design, manufacture and sale of a complete line of modern polishing and buffing machinery and allied equipment. Norman Chester, formerly with a well known metal finishing equipment manufacturer the past 23 years, has resigned and will assume management of this new firm.

Minnesota Ore Directory Published for 1939

■ Story of iron ore is told in detail by the University of Minnesota's Institute of Technology in its *Mining Directory of Minnesota,* just issued for 1939.

The 240-page pamphlet offers complete information on historical background and personnel of Minnesota ore mining, presents in maps the location of mines, beneficiation plants and loading docks, in tables the annual amount of shipments, taxes, wages and other costs. American ore production is compared with that of other nations.

Estimated reserves for all major domestic ore ranges (including stockpiles): Minnesota, 1,244,202,263 tons (as of May 1, 1938); Michigan, 149,754,897 tons (as of Jan. 1, 1939); Wisconsin, 5,000,000 tons (as of Jan. 1, 1939).

Lists Ten Harbingers of More Prosperous Times

■ R. E. Desvernine, president, Crucible Steel Co. of America, New York, sets forth in the current issue of Crucible News several factors which he regards as harbingers of better times. If we are to prosper, he said, we must courageously and intelligently "do business."

Mr. Desvernine said the following views looking toward better business are based on a consensus of many leading industrialists directly and indirectly related to the steel industry and personally interviewed recently:

First, we must be greatly encouraged by recent indications of real and far reaching change in thinking of rank and file of people on political policies.

Second, inventories in general are low, in most cases below normal, which usually forecasts improved customer demands.

Third, widespread urgent need of replacements and modernization exists, resulting from years of enforced economy.

Fourth, farmers purchasing power above 1937-1938, and outlook favorable.

Fifth, trade index of general business marked by considerable advance recently and every reason to believe, despite interruptions, further moderate net gains will continue.

Sixth, continuance of monetary and credit expansion and federal spending is bound to have some consequential effect, even though temporary and artificial.

Seventh, reflection in export trade of inquiries in armament purchases will be noticeable.

Eighth, this has been one of most active building seasons in nearly a decade.

Ninth, so far average business this year is generally better than last, which has improved business virility, and there is every indication the balance of year will insure a better 1939 than 1938.

Tenth, unprecedented backlog of reserves in banks and hands of private investors seeking investment if released from fear of insecurity.

Equipment

New York — Adding to an already well sustained foreign demand, is a somewhat improved interest from domestic buyers of machine tools. District sellers here expect domestic business to exceed that of June, notwithstanding the holiday lull around July 4.

No large domestic inquiries are being figured, as there are no major expansion programs. Demand is largely replacement business, bolstered by scattered items of new equipment.

Aviation requirements are important, with orders coming through not only from regular manufacturers of airplane equipment but from those receiving supplementary contracts for various parts. There is also steady demand from the government, for equipment for ordnance shops and navy yards. Private shipyards are also rehabilitating equipment to meet constantly expanding work. The flurry in demand from stamping shops continues.

Deliveries of some of the larger machine tool companies are the most extended in considerable time. Some builders of horizontal boring machines, planers and internal grinders and certain other types of equipment are said to be booked solidly over the remainder of this year. One leading builder of lathes can accept nothing under 20 weeks.

Chicago—Closing on a number of lists the latter part of the week is expected to bring this month's business at least to a par with June. August outlook is good. Detroit demand is holding well and expected to be higher next month. Present demand locally is very diversified, and a number of new inquiries are noted from shipbuilding interests on the Gulf and the west coast. Railroads are exerting no demand for equipment. Agricultural implement plants are busier but have yet to increase machine tool and machinery buying noticeably.

Seattle — Seasonal requirements generally have been placed and demand has eased. Electric and pumping equipment is still fairly active and Bonneville authority continues to buy miscellaneous items for substations and power lines.

Spokane, Wash., has received bids for five miles copper wire, Fort Lewis, Wash. opens bids July 31 for electrical equipment. Denver has called bids Aug. 1, Spec. 866, for pipe, fittings and appurtenances for Coulee emergency gate inlets and drum gate control.

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ADVERTISING PAGES REMOVED

Construction and Enterprise

Ohio

CLEVELAND — Phoenix Ice Machine Co., M. Bollinger, president, has plans for a $40,000 addition to its plant. W. G. Caldwell, Engineers' building, Cleveland, consultant.

CLEVELAND—Euclid Doan Co. plans to build a power plant addition and install new boiler at total cost of $40,000. R. A. Spangler, 4614 Prospect avenue, Cleveland, engineer.

DAYTON, O.—Army air corps, construction quartermaster, Wright field, is taking bids to 10 a.m., Aug. 21, on seven transformers and one 6900-volt reactor. Inventory 6681-40-2.

EATON, O. — Village, E. M. Bristow, mayor, is revising plans for construction of sewers and expansion of its sewage disposal plant. Will install new settling tank and sludge beds. Total cost estimated at $40,000. M. W. Tatlock, 911 Ferndale avenue, Dayton, O., consulting engineer.

LIMA, O.—Ohio Steel Foundry Co. has awarded contract to Herbert Tuttle, 350 South Woodlawn avenue, Lima, for a 188 x 223-foot structural steel roll machine shop costing about $150,000. (Noted June 12.)

PT. CLINTON, O.—Village, Fred W. Slauterbeck, mayor, has approved plans and may issue bonds to finance proposed sewage disposal plant and sanitary sewerage system costing an estimated $350,000. Consulting engineers, Champe, Finkbeiner & Associates, Toledo, O. (Noted May 1.)

VERSAILLES, O.—City, Ralph Pittensbarger, clerk, has completed plans and will soon advertise for bids in the construction of sewers and a sewage disposal plant costing in all $129,000. Consulting engineer, P. A. Uhlmann, 299 South Front street, Columbus, O. (Noted July 3.)

Massachusetts

PALMER, MASS.—Commonwealth of Massachusetts, department of mental health, Boston, plans to build at Monson State hospital a sewage treatment plant with Imhoff tank and trickling filter estimated to cost total of $60,000.

New York

CORNING, N. Y.—Corning Glass Co. has prepared plans and soon will build a five-story, 80 x 125-foot laboratory costing over $50,000. Structure is to have glass block walls.

JAMESTOWN, N. Y.—Jamestown Metal Equipment Co. Inc., O. A. Lenna, president, is drawing plans for a factory to cost $500,000 with equipment and machinery. E. B. Card, company chief engineer.

NIAGARA FALLS, N. Y.—Vanadium Corp. of America is taking bids on a three-story plant addition costing an estimated $40,000.

Michigan

DEARBORN, MICH.—Ford Motor Co. has awarded to Bryant & Detwiler Co., Penobscot building, Detroit, contract for a one-story, 300 x 680-foot building costing about $500,000 for final assembly and driveaway storage of automobiles.

GRAND RAPIDS, MICH.—Keeler Brass Co. has plans for a one-story factory addition costing about $50,000. Robinson, Campau & Crowe, Michigan Trust building, Grand Rapids, engineers.

KALAMAZOO, MICH. — Fisher-Graff Iron & Metal Co. proposes to build a one-story, 55 x 160-foot warehouse costing approximately $40,000.

Illinois

EAST PEORIA, ILL.—Central Illinois Light Co., L. E. Brown, general superintendent, plans to build an extension to its power plant, installing a 35,000-kilowatt turbo-generator and 375,000-pound boiler.

ROCHELLE, ILL. — City proposes to build a waterworks and distribution system costing $90,000. Russell & Axon, 4903 Delmar boulevard, St. Louis, consulting engineers.

Kentucky

LEBANON, KY.—City will take bids in August on a $100,000 sewerage system and a $50,000 sewage treatment plant. J. Stephen Watkins, Lexington, Ky., engineer.

OWENTON, KY.—City proposes to construct an electric generating station and distribution system costing approximately $50,000. R. W. Chanaberry Inc., Louisville, Ky., consulting engineer.

Florida

MIAMI, FLA.—Florida Power & Light Co., D. G. Bouton, purchasing agent, is receiving bids for remodeling its plant and insulating foundations for a condenser unit.

Georgia

ATLANTA, GA.—Atlanta Metallic Casket Co., has awarded contract to Jiroud J. Jones Co., 205 Walton building, Atlanta, for constructing a four-story, 97 x 104-foot factory building costing $51,000.

ATLANTA, GA. — Southern Wire & Iron Works is receiving bids for construction of a one-story factory and office building, 125 x 162 feet. James C. Wise, 161 Spring street building, Atlanta, architect.

North Carolina

KERR, N. C. — Four-County Electric Membership Corp. has received an additional REA allotment of $90,000 for 97 miles rural electric power transmission lines serving 371 consumers in four counties. S. S. Shubrick, Kerr, superintendent.

Minnesota

MINNEAPOLIS — Werner Transportation Co. proposes to build a terminal warehouse costing $78,000. Will need equipment. P. E. Crosier, Phoenix building, Minneapolis, architect.

MOORHEAD, MINN.—City, R. G. Price, clerk, is preparing specifications on a new 3000-kilowatt turbine for installation in municipal light and power plant.

Texas

AGUA DULCE, TEX.—C. H. Alexander and associates, 222 Roseborough street, San Antonio, Tex., plan to build at cost of $250,000 a 150,000,000-cubic foot condensate plant and recycling unit.

STAMFORD, TEX.—Stamford Electric Co-operative Inc., Hugo B. Haterius, representative, is taking bids for 212 miles rural electric power lines in three counties. William G. Morrison, 2102 Bryan street, Dallas, Tex., consulting engineer.

WEATHERFORD, TEX. — City, C. F. Russell, mayor, soon takes bids on an electric light plant and distribution system costing $250,000. Will require diesel engines and generators.' A. C. Moore & Co., San Antonio, Tex., consulting engineers.

WINNSBORO, TEX.—City, R. H. McCrary, mayor, plans to rehabilitate its water system at cost of $45,000. New equipment will be needed. A. C. Moore & Co., San Antonio, Tex., engineers.

Kansas

TECUMSEH, KANS.—Township, S. H. Henessy, Route 1, representative, is preparing plans for a waterworks system, including tank and tower. O. J. Eidman, 638 New England building, Topeka, Kans., consulting engineer.

Iowa

CASTANA, IOWA—City will hold an election Aug. 3 on proposal to issue bonds to finance improvement of its waterworks.

KNOXVILLE, IOWA — United States government, veterans' administration, L. H. Tripp, local director, takes bids until 1:30 p.m., Aug. 15, on a boiler house and installation of a boiler.

NEW HAMPTON, IOWA—City, Alvah Griffiths, clerk, takes bids to 7:30 p.m., Aug. 15, on two sections of an addition to its power plant. Involves installation of a 750-kilowatt turbo-generator and other equipment. Ralph D. Thomas & Associates, Minneapolis, engineers. (Noted July 24.)

NEW LONDON, IOWA—Village, Ora Williams, clerk, takes bids to 1:30 p.m., Aug. 22, on a 400-kilowatt steam turbo-generator, a surface condenser with circulating water pumps, cooling tower and a boiler. Stanley Engineering Co., Muscatine, Iowa, consultant.

Montana

FT. PECK, MONT.—United States divisional engineer, 1201 Davidson building, Kansas City, Mo., is taking bids to 11 a.m., Aug. 16, on a 50,000-horsepower and a 20,000-horsepower turbine, each complete with all appurtenances, for installation at Ft. Peck dam. Bid bond 10 per cent to accompany bid.

MISSOULA, MONT.—American Crystal Sugar Co., M. B. Wilson, manager, proposes to spend $100,000 on factory improvements including a new power plant.

Pacific Coast

SPOKANE—City plans to construct a complete sewage disposal system and is making surveys. A. D. Butler, city engineer.

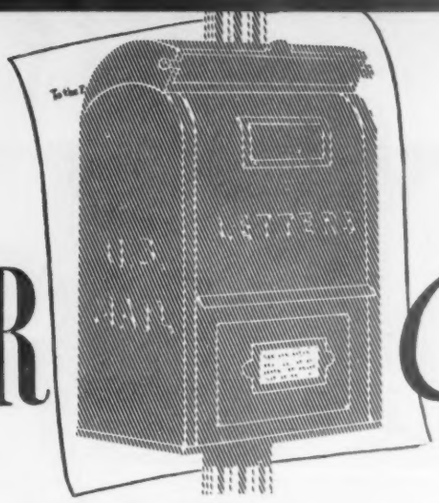
VANCOUVER, WASH. — Independent Petroleum Co. has been incorporated with capital of $100,000 by P. L. Polsky and associates. Firm has acquired a five-acre river-front tract and will build storage tanks and distributing plant.

Canada

CALGARY, ALTA. — Pacific Petroleum Ltd., W. N. Graburn, manager, Vancouver, B. C., will build a refinery costing approximately $100,000.

GATINEAU, QUE.—Masonite Co. of Canada Ltd., S. L. de Carteret, Montreal, president, soon will take bids on a factory to cost $150,000.

MT. ROYAL, QUE.—Seven-Up Ltd., 21 Essex street, Toronto, has plans for a bottling and manufacturing plant to cost about $40,000. Perry, Luke & Little, Montreal, consulting engineers.



READER Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

On "American Destiny"

By JOHN H. HERTNER

President, Hertner Electric Co., Cleveland

To the Editor:

Lippmann's article in the June 19 issue of STEEL contains much truth about the mental attitude of the American people today. I believe, however, that he unduly emphasizes some things, draws improper conclusions as to the cause of this worry and is very indefinite as to its cure and how the "American Destiny" is to be attained.

Enjoying a great measure of personal freedom, our citizens can indulge in the luxury of having fetishes, enjoying reforms, pursuing crazes and hallucinations and doing social experimentation, all of which are beyond the reach of more closely governed people. Since we are generally more or less evenly divided on all of these excursions, some of us are always disappointed and in many cases, where the final results are not favorable to either side, all of us feel rather badly hurt.

The Three Great Disappointments according to Lippmann are: The World war; Financing of Europe during the Coolidge administration; the Roosevelt "reforms."

It would seem that of these the first and second have had little to do with our present state of mind, nor were they more disappointing to most of our people than some occurrences that will now be mentioned.

Going back into history about as far as anyone alive today can remember, we have the war of 1861-1865. We were divided into two conflicting parties. The result was definitely decided after much suffering. Today it is a question whether as good a decision could not have been reached without the attending bloodshed. It might be added that the aftermath is still with us.

This war was followed in due course by a depression like, but probably more severe than that of 1929. There seems to have been plenty of suffering and the same gloom.

Then came Bryan and free silver in the late nineties. This was settled by not too great a majority and there are those who today feel that the decision was wrong. At about the same time we made an excursion in altruism by way of the Spanish-American war; more bloodshed. We expect soon to be clear of the Philippines and have long been out of Cuba. It is uncertain whether the average Cuban is any happier or safer as to his skin than under Spanish rule.

Both Sides Disappointed

Over a period of many years the idea of prohibition had been gathering strength. It finally won and was written into the constitution. It was here to stay. Never again the saloon. After about 13 years we are back with the saloon and conditions are admitted to be just a little worse than before 1920. Because the prohibition reform turned both ways, both sides had the joy of being disappointed. In fact, I believe outside of the third great disappointment, prohibition has been the greatest heart breaker.

The first great disappointment had just been terminated. The dry spell of 1920 to 1933 had begun when the second great disappointment was consummated. We should not forget, however, that Coolidge must not be given too much credit for this adventure, which really started in Wilson's time and is still a burning issue. It is a question, too, as to how much despondency and perplexity it caused the average American who is more concerned with the national league standing than he is with federal taxation.

Up to the time of the third great disappointment, contrary to Lippmann's opinion, the American mind was fairly normal. In fact, I believe that the new dealers, who constitute the third disappointment, accuse business and business men of being too optimistic during the twenties. It certainly is true that there were many "it won't rain any more" boys in the country at that time. This optimism probably hastened and intensified the smash which hit us in 1929.

To be sure, there was despondency in the 1929 to 1933 period. There always is during a depression. To be sure, there were those business men who pestered the government to "do something". There always are. But the big bulk of business sat tight, confident that things would right themselves in the end.

I cannot express myself too strongly that the third great disappointment brought with it all of the gloom which now exists. It also introduced this new element of perplexity which never seemed to be present before. To discuss this thoroughly would take too much time and space. It can be summed up by stating: 1—Industry over the years has never averaged an exorbitant profit. 2—all the nostrums advanced are pointed to minimize or remove the possibility of such profit. 3—the new deal has ridden from one victory to another and each victory has put us deeper into

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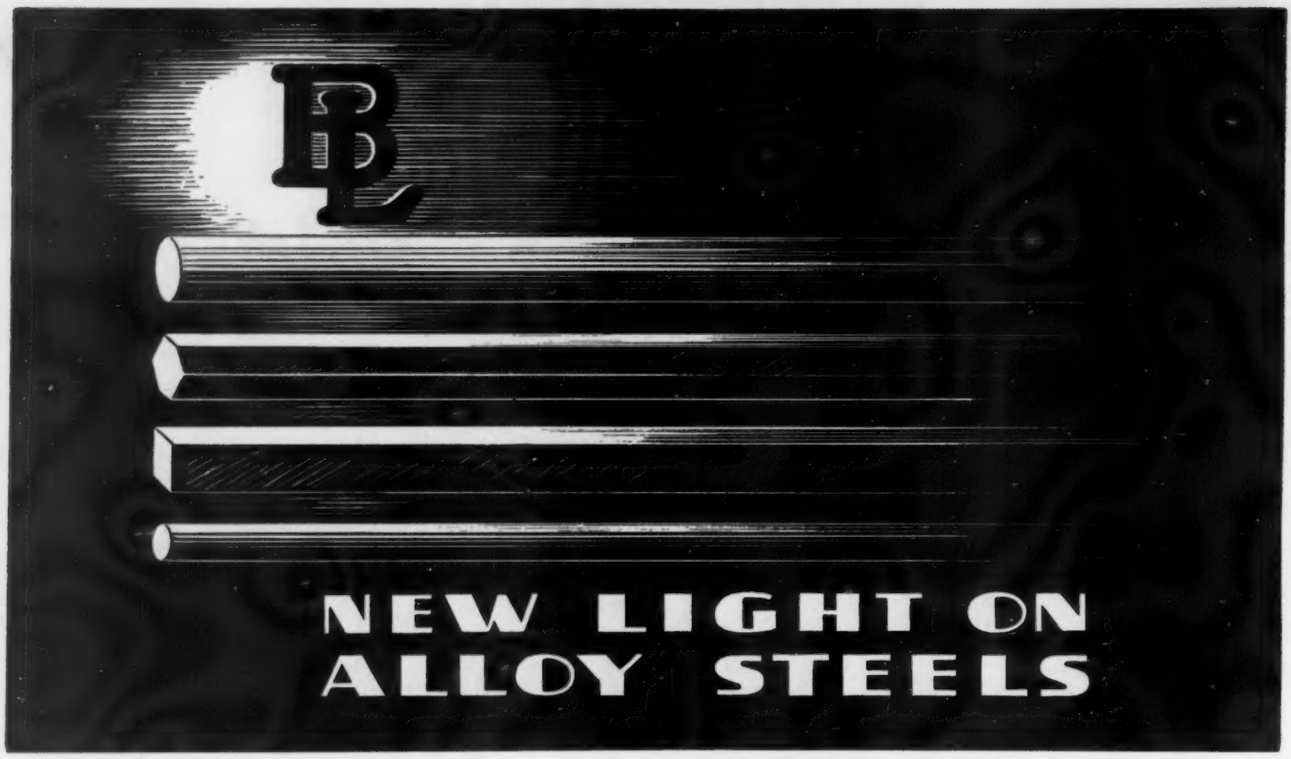

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